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COMPUTERWORLD

Users dismiss fast 486 CPU

Chip fits in few systems, also adds to confusion

BY CAROL HILDEBRAND and JIM NASH
CW STAFF

Information systems managers said last week that they are finding significant shortcomings in Intel Corp.'s new speed-doubling microprocessor and the marketing strategy behind it.

As a result, user sentiment ran counter to the carnival-like atmosphere exhibited by hardware vendors who gathered in Burlingame, Calif., to demonstrate personal computers running Intel's new I486DX2 50-MHz microprocessor and upgrade boards for 486DX-based systems.

Looking past the glitz and noise accompanying the chip's release, some users said they are concerned with the overlap of

Continued on page 10

Client/server satisfaction

Users indicate a high level of satisfaction in response to the question, "How satisfied are you with your applications development tools?"

See Buyers' Scorecard page 86

Product	Score
Powersoft's PowerBuilder	8.5
Uniface's Uniface	8.2
Revelation Technologies' Advanced Revelation	8.1
Gupta Technologies' SQL Windows	7.6
DataEase International's DataEase	7.4

Highest possible score: 10.0
Average: 8.0

CW Chart: Janell Genovese

Host software pricing gets murky

BY JOHANNA AMBROSIO and NELL MARGOLIS
CW STAFF

In what many are calling a mixed blessing, mainframe users will soon see a plethora of pricing options for their software and an end to the tiered model as the sole industry standard.

However, with different vendors expected to introduce various plans, it may be two years or longer before any consensus prevails.

This will likely mean a period of confusion as both users and vendors attempt to sort out all of the alternatives and settle on a few that make sense to the majority, observers said. Users will need to spend more time and energy evaluating and managing, almost on a vendor-by-vendor basis, what is being offered, analysts said.

Reynolds Metals' Matsey raps *tiered pricing policy*

"The new license models are immature," said Bill McNee, program director of the Software Management Strategies Service at Gartner Group, Inc. in Stamford, Conn. "This will require increasing sophistication from the user to identify the most appropriate strategy."

The following are among the options now offered or contemplated for host-based software:

- Pricing based on the number of million instructions per second consumed and a highly customized program modeled along the lines of airline frequent-flier plans. MIPS-based pricing will be introduced by

Continued on page 14

No rest for virus defenders

Little havoc wreaked by Michelangelo strain

BY MICHAEL ALEXANDER
CW STAFF

The extensive publicity that preceded the March 6 trigger date of the Michelangelo virus appears to have put U.S. corporations on alert and impelled them to ferret out the potentially damaging virus before it could detonate.

An informal poll Friday of about 12 U.S. companies indicated that the virus did little, if any, damage.

At Bank of Boston Corp., for example, a "SWAT team" in Boston hunted down and removed the virus from two personal computers before the trigger date, said Monte Ford, director of information services.

Frito-Lay, Inc. in Dallas "had a couple of early detections of Michelangelo and cleaned up two DOS machines we were having upgraded two weeks ago," said Jack Sprague, a consulting engineer.

Sprague said he expects "fewer than a dozen cases this week or next, based on previous history."

Computer users in other parts of the world may not have taken the threat as seriously, said John McAfee, president of

Continued on page 16

MIGRATION FRUSTRATION

Worried VS users seek an open path

BY KIM S. NASH
CW STAFF

Nine months after Wang Laboratories, Inc. cozied up to IBM with a substantive reseller pact, Wang VS users are still confused about what the deal means for them — and for the future of Wang.

"My sense is that users are pretty confused about what Wang's doing and why they should go along," said Ramsay Millar, chairman of the Americas Pace Special Interest Group, a Wang user group in British Columbia.

The uncertainty lingers despite the fact that Wang executives, including Chairman Richard Miller, are now crisscrossing the U.S. as part of a worldwide tour, both to explain the nuances of Wang's stay-alive software and services strategy and to assuage fears that the proprietary VS minicomputer line is headed for the morgue.

"We've talked to more than 2,000 customers on the road show and received overwhelmingly positive reactions to our planned VS enhancements and our Unix strategy," a Wang spokesman said. Some VS customers — primarily those heavily into imaging — stand solidly behind Wang, with no plans to unload VS boxes, he said.

However, imaging is no panacea, warned Bill Sines, director of midrange strategies at Technology Investment Strategies Corp. in Framingham, Mass. "The imaging market isn't all that big, and it's not clear that Wang can grow it," he said.

Continued on page 21

Chomping at the bit

Wang user concerns:

- Precarious finances.
- Wang's about-face on the AS/400.
- Questions about Wang's commitment to producing future VS models.
- An unshipped Unix version of Pace.

Personal data more public than you think

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — In the underground market for personal information, the going rate for your 10-year earnings history is $175.

That price tag surfaced in an 18-month federal investigation of a nationwide ring of "information brokers" who allegedly bribed Social Security Administration employees to make computer searches for the records of thousands of people. According to officials, the alleged SSA accomplices receive $25 per record, but the broker gives it a big markup and sells the information to private investigators, creditors and businesses for $175.

"The investigation appears to involve the largest case ever of theft from government computer files and may well involve the most serious threat to individual privacy in modern times," said U.S. Sen. Daniel Patrick Moynihan (D-N.Y.) at a hearing on the matter late last month [CW, March 2]. The SSA has earnings records for nearly 140 million workers.

It is not just consumers who should be concerned. The emergence of this black market in personal information also means that corporate data security officers should be extra vigilant about protecting personnel and customer records, said security consultant Robert P. Campbell, president of Advanced Information Management, Inc. in Woodbridge, Va.

Continued on page 14

INSIDE

Amdahl delays availability of high-end systems until the third quarter. Page 4.

Microsoft to take DOS, Windows into 32-bit world. Page 4.

Demystifying DEC's LAN integration strategy. Page 6.

Apple reveals System 7.0 licensing plan. Page 7.

Product Spotlight — Getting a grip on client/server: the terminology and the tools. Page 73.

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IN THIS ISSUE

NEWS

4 Features such as on-line Help and multimedia enhancements to **Lotus'** Freelance generate mixed reactions from users.

6 A start-up firm offers tools that will simplify client/server applications development.

7 **Apple** is planning to license its System 7.0 operating system components.

8 **United's Covia** joins with **Europe's Galileo** to form the first global reservation system and give American Airlines' **Sabre** a run for its money.

10 **KnowledgeWare** is targeting Unix, but users say they can't get excited until there are products to support it.

12 **New York City** devises a safety net for telephone carriers to help each other during power outages.

14 A computer security and awareness group forms with a goal of establishing companywide security guidelines.

15 **Unix International** spreads out its annual **Roadmap** for Unix System V.

16 **Intel** inadvertently ships 839 copies of LANSpool for Netware that were infected with the **Michelangelo** virus.

24 **DEC** tries to lure employees to early retirement with short-term incentives.

Quotable

"It's like 20 years ago in the car industry, when Detroit found out they could put different trim on cars and put out 15 different models."

BOB FLEGAL
BHP MINERALS

On Intel's DX2 chip strategy. See story page 1.

DESKTOP COMPUTING

37 Macintoshes at **Colgate-Palmolive** invoke a **Muse** to access data they don't even know is there.

45 Technology Analysis: **Borland** and **Symantec** offer improved versions of their C++ environments for Windows: Symantec's Zortech is more versatile, while Borland's C++ combines power and ease of use.

WORKGROUP COMPUTING

47 **Sun** strives to scrap its reputation for slipshod service and support.

ENTERPRISE NETWORKING

55 A Southern university says 3Com's **Linkbuilder** meets its needs, but it still wants more from the hub.

LARGE SYSTEMS

59 Vendors form alliances that will wipe out competition — and maybe users' wallets.

APPLICATION DEVELOPMENT

61 Removing programming hassles from Windows conversions.

MANAGER'S JOURNAL

97 IS chief puts her diverse background to work at **Sears Mortgage**.

PRODUCT SPOTLIGHT

73 Untangling the confusion of choosing tools for client applications.

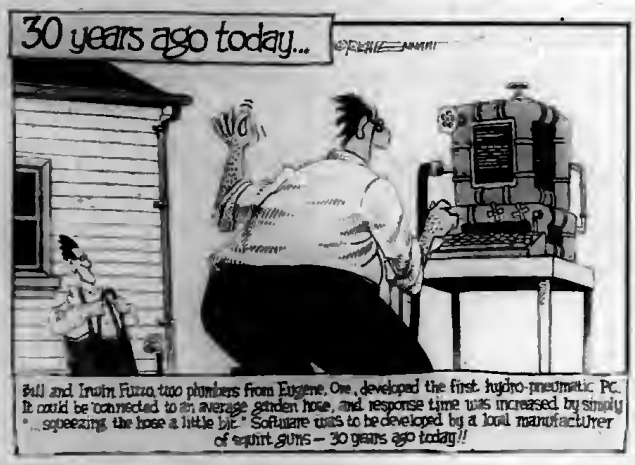
IN DEPTH

91 Why you wouldn't get the most out of a commercialized national network today. By Gordon Cook.

DEPARTMENTS

12, 16 News Shorts
28 Advanced Technology
32 Editorial
102 Book Reviews
104 Calendar
107 Computer Careers
109 Fast Track
116 Marketplace
120 Stocks
121 Computer Industry
122 Inside Lines

The 5th Wave



EXECUTIVE BRIEFING

■ **The Michelangelo virus struck IBM and compatible PCs** on March 6, the birthday of the famous artist. Initial assessment showed that U.S. companies were well-prepared for the virus, whereas businesses worldwide — from Japan to Egypt to New Zealand — were reporting more damage. Analysts are stymied regarding the speed and reach of this particular virus, which appeared in 10,000 instances within a period of just one month. **Page 1.**

■ **Commercializing the National Research and Education Network** may eventually enable companies to communicate over wide areas at gigabit-per-second speeds. However, poor planning that pits academic and business network users against one another on issues of cost, security, access and reliability may keep this vision from being realized. **Page 91.**

■ **Mainframe software users and vendors alike** are grappling with a panoply of alternatives to CPU-based tiered pricing. But opinions vary widely as to which models best assuage user fears of being charged for nothing while calming vendor fears of running out of profits. And not all users are crying for suppliers to wipe away their tiers. **Page 1.**

■ **The Electronic Frontier Foundation is using a band of computer and communications companies** to define an open telecommunications platform that could bring interactive data services to millions of businesses. **Page 55.**

■ **Amdahl will delay shipments of its top-of-the-line mainframes** until the third quarter. It had planned to deliver the systems — six- and eight-way units that would beat IBM's mainframes in terms of processing power — in the second quarter. **Page 4.**

■ **Users who have had their data scrambled by viruses** and suffered physical or economic harm as a result should not hesitate to tell a judge if their virus was transmitted by a commercial software vendor. **Page 37.**

■ **When people talk about bringing a world of experience** to a top IS position, Sears Mortgage's Leilani Allen may be what they had in mind. For the past three months, she has been drawing on a globe-trotting childhood to establish herself in her new role. **Page 97.**

■ **Once proprietary with a vengeance, Apple** will begin to license new System 7.0 technology later this year. How much of System 7.0 will be licensed and how it will be implemented are among the questions that still loom. **Page 7.**

■ **At PHH Corp., a significant part of the strategic plan** is to freeze investments in the automation of 'business as usual' in the maturing company and apply those resources radically alter the business. **Page 97.**

■ **On site this week:** A new imaging system may be nice, but only if the staff wants to use it. Getting doctors and nurses interested in a new system led officials at Fox Chase Cancer Center in Philadelphia to search for a familiar interface. **Page 68.** An application that was designed for the public sector may end up helping private industry, too, if an imaging pilot project involving California driver's licenses proves successful. **Page 59.** Getting to the core of how a system works may let the computer help users think. A Macintosh-based application developed by Colgate-Palmolive allows marketing managers to spot trends by interactively analyzing data, even if the managers have no idea where the data resides. **Page 37.** Phenomenal company growth outpaced processing capacity on Taylor Medical's IBM System/36s dramatically. The Beaumont, Texas-based health-care equipment supplier opted for a PC-based LAN as a replacement and found that it could minimize its investment by porting its System/36 software to the LAN. **Page 41.**

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Scaled-down OS/2 graphics engine on way

BY ROSEMARY HAMILTON
CW STAFF

BOCA RATON, Fla. — IBM last week adjusted plans to deliver a full-blown 32-bit graphics engine with OS/2 2.0, saying it will instead provide a hybrid engine based on 16- and 32-bit technology.

However, IBM said this should not lessen the graphics performance that users have been expecting with 2.0. The change was revealed at IBM's biweekly update on OS/2.

Tommy Steele, director of IBM's Personal Systems programming laboratory here said IBM had been working on both engines simultaneously and decided that the full-blown 32-bit engine was not ready to ship with 2.0 at the end of this month. Meanwhile, performance with the hybrid engine had improved enough that the company decided to ship it with the 2.0 code.

The full-blown 32-bit graphics engine is being built with the help of Micrografx, Inc. The firm's chairman, J. Paul Grayson said the engine is essentially complete and IBM is being "very rigorous" in its testing and decided to hold off on its delivery. Steele said programmers were able to add enough performance improvements to the hybrid engine, originally a 16-bit engine, with more 32-bit code.

"This is something that customers will have absolutely no idea about whether [the full-blown 32-bit engine] is in or not," Steele said. "We need more time to do the rest of the work and the tuning" on the newer engine, he added.

In an interview in early January, Steele said IBM would ship the 32-bit engine with 2.0. A company spokesman said that was the plan at the time, but subsequent testing showed the hybrid engine was the safer bet.

IBM also said last week that the 2.0 code is "frozen" and that no new functions will be added. More fine-tuning will be done during the next few weeks, and the company is still planning to deliver the code electronically by March 31.

Lotus to talk multimedia

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. is expected to outline a multimedia strategy today that targets integration with its existing applications rather than separate products.

Specifically, the company's multimedia efforts will focus on three key areas: adding new on-line Help facilities across its product suite; providing support for additional media for its communications products, including Notes; and adding unspecified multimedia enhancement to Freelance.

Some customers contacted last week said they needed time to determine how useful the Lotus technology will be.

"On a day-to-day basis, I'm not really sure how to apply it," said Joseph Herrin, director of systems development at Joseph E. Seagram & Sons, Inc. in New York. "Someday we'll have voice annotation and videoconferencing, but I think we're a few years away from that."

She wants some Help

However, Dana Tate, an information systems analyst for the city of Irving, Texas, said the on-line Help would likely be the most useful function. Tate said training for 1-2-3 is causing problems because of the number of different versions and hardware platforms that the spreadsheet runs on.

If Lotus does provide this feature, "it would be great," Tate said. "When we offer classes now, it's hard to cover all the bases. Usually, our people go into classes cold turkey. If they had the on-line Help, it would be a lot more helpful to them."

Steve Barlow, a product manager of multimedia at Lotus, stressed that Lotus intends to offer productivity gains rather than just lend voice and video capabilities to its software.

Protocol-independent routing unveiled

BY JOANIE M. WEXLER
CW STAFF

MARLBORO, Mass. — CrossComm Corp. is expected today to announce a router architecture aimed at taking a bite out of the problem of blending "unroutable" IBM networking protocols into LAN internetworks.

The "protocol-independent routing" function in CrossComm's Universal Router Architecture reportedly goes a step beyond the source-route bridging and encapsulation techniques used to haul IBM protocols today. Available now, it collects physical-layer addresses, NetBIOS names and other data about all network devices and stores it in a hardware-based directory, CrossComm said.

This allows IBM Systems Network Architecture (SNA) and NetBIOS protocols to be delivered directly to their destinations in native mode.

Node-to-node native routing is currently reserved for routable upper-layer protocols, such as Apple Computer, Inc. AppleTalk, Digital Equipment Corp. DECnet, Novell, Inc. IPX and Transmission Control Protocol/Internet Protocol (TCP/IP). IBM protocols do not map to the Open System Interconnect seven-layer communications model as these protocols do, so they cannot be routed the same way.

IBM's multiprotocol router, announced in January, encapsulates SNA and NetBIOS protocols in TCP/IP. But CrossComm's scheme reportedly bypasses the performance slowdown inherent in encapsulation routing techniques and eliminates the broadcast problem with source-route bridging NetBIOS protocols.

"I think this will go a long way in reducing unwanted overhead in enterprise networks," said Steve Coppel, a telecommunications executive at First National Bank of Maryland, a CrossComm shop in Baltimore. "I'm looking forward to the release because it brings advanced routing to IBM customers."

CrossComm's database of information also gives users more information about their networks, which they can use to diagnose problems.

"Right now, we have no network management, so it would be very helpful to see who's using up network bandwidth," said Sandra Duphily, local-area network administrator at Ocean Spray Cranberries, Inc., a CrossComm customer in Lakeville-Middleboro, Mass. For example, "if a card went had and was sending out a whole bunch of bad packets, we could figure that out," she said.

Network diagnostics is "definitely an issue," said Jim Ziegler, manager of information systems at CrossComm shop Comdisco Disaster Recovery Services in Rosemont, Ill. "This will be helpful as long as it is not disruptive to the network."

The vendor said the database function was designed into hardware rather than software so as not to impact network performance.

Amdahl mainframe delays raise technology concerns

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Amdahl Corp. last week disclosed a delay in the shipment of its most powerful IBM-compatible mainframes from the second to the third quarter of this year.

Word of the delay of the 248 million instructions per second (MIPS), six-way 5995M computer and the top-of-the-line 310 MIPS, eight-way 5995M machine caused some large Amdahl users to worry that their supplier may be losing its ability to keep pace with the technological changes IBM has made to its Enterprise System/9000 system, compared with the older IBM 3090.

The delay could also cause Amdahl to lose its half-year lead over an eight-way IBM ES/9000, which some analysts expect to ship by next year.

The mainframe setbacks follow delays last summer in Amdahl's shipment of its 6390 disk drives, which are compatible with IBM 3390 drives. The $2 billion firm also experienced manufacturing problems with the K model of its 6380 drives and was forced to recall them last fall to change a flawed air-filtration system.

A company spokesman said the delay in Amdahl's high-end systems was caused by efforts to repair a faulty automated console system for the 5995M line, of which lower-end models began shipping last year. "What it did was to push the whole [product] cycle out," he said.

Amdahl is now testing the high-end 5995M machines before certifying them as ready for customer shipments, he said.

The delay raised questions at some large shops about how Amdahl is responding to design alterations in IBM's ES/9000 series involving compatibility with IBM's ESCON and Sysplex features.

"It's in their best interest to keep up," said Ron Kreigel, resource manager for the state of Illinois' Information Service Division. "I know they have to run behind [IBM], but the question is, what is a reasonable amount of time for them to develop new technology?" Kreigel plans to shop for a new mainframe in the next 12 months — and will put out a request for proposals to IBM, Amdahl and Hitachi Data Systems Corp.

Two, two APIs in one

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Windows developers may be less in need of a crystal ball to divine whether to write products to either or both of Microsoft Corp.'a 16- and 32-bit application programming interfaces (API). Last week the company foretold of a third interface in Windows' future that will reportedly allow developers to produce applications that can run on both.

With Win32s, a subset of the Win32 API, a single transitional application capable of running on both the 16-bit Windows 3.1 and the 32-bit Windows New Technology (NT) could be written. This would save the effort of simultaneous development, the company said.

Win32s technology will be available for review at the Microsoft Win32 API Professional Developers Conference from July 6 to 8.

Server tools affected

Joel Diamond, technical editor of "Windows Journal" in Media, Pa., said Win32s may have the most impact on server tools from companies such as Oracle Corp. and Lotus Development Corp. Those developers will be among the first to want access to NT as a server platform, but they also need to be able to support the large installed base of 16-bit Windows, he said. Using Win32s would give them an entry to both platforms.

Diamond added that there are no guarantees NT will take the world by storm after its release and that Win32s could help developers hedge their bets.

Currently, applications can be written to either Win16 or Win32. Win16 applications can run under Windows 3.0, 3.1 or NT but cannot take advantage of 32-bit features such as flat-memory addressing, a 32-bit data path or NT's preemptive multitasking. Applications written to the Win32 API will be able to fully utilize NT but will not run on Windows 3.1. This discrepancy could have forced developers to write two versions of the same application, and Microsoft was concerned that it might have prevented some developers from writing applications for NT.

The new API should be a boon to developers, but the "big question is how you move to" 32 bit, said Arthur English, a Windows developer and consultant in Plano, Texas. He said that for now, the best a developer can do is to keep code as clean and modular as possible to make the move to 32-bit interfaces a smooth one.

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Largest worldwide DEC VAX VMS RDBMS market share: 51% -Gartner Group

Fastest benchmark on an IBM-compatible mainframe: 416 tps -Codd & Date

Largest worldwide MS-DOS and OS/2 RDBMS market share: 41% -Gartner Group

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Users doubt DEC's LAN links

Firm's ability to integrate multivendor systems questioned

BY ELISABETH HORWITT
CW STAFF

MAYNARD, Mass. — Like a caterpillar stuck in its cocoon, Digital Equipment Corp. has yet to pull off its metamorphosis from a proprietary hardware vendor into a multivendor local-area network integrator. Users and analysts interviewed last week agreed that DEC may have bitten off more than it can chew.

DEC has aggressively positioned its Pathworks software as the glue that allows disparate LAN clients to access resources on a variety of servers across the Fortune 1,000 corporation.

The product line now links the major client platforms to LAN-based and corporatewide electronic mail, database and network services that run on DEC VAX/VMS and, to a lesser extent, OS/2 and DEC Ultrix servers.

Pathworks is a key component of DEC's strategy to become a one-stop LAN integration shop. Other elements include a burgeoning network integration division, a slow but steady migration to open platforms, such as Open Systems Interconnect and Open Software Foundation/1, and alliances with key network operating system vendors.

However, DEC has yet to convince many corporate network managers that the Pathworks product line has become solid enough to solve their LAN integration problems.

Impending pitfall

A major Pathworks drawback is that its "versions" of Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager will support the original network operating systems' clients and applications but will not interoperate with them, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C.-based consulting firm.

For example, DEC will provide its own E-mail service to LAN Manager clients but will not support LAN Manager E-mail, a DEC spokeswoman said.

The vendor's latest move is an agreement to resell, service and support Banyan Systems, Inc.'s Vines network operating system that stops short of integrating it with Pathworks.

"If I were a strictly DEC shop, I would go with DEC" as a corporatewide LAN integrator, said Mark Anderson, a lead analyst at 3M Co. "But there are vendors with a better handle on the multivendor environment." 3M is now working with IBM, Hewlett-Packard Co., Microsoft and probably Novell to integrate a wide variety of LAN systems, Anderson said.

Anderson's chief beef with DEC is that the vendor's integration strategy is still mostly promises, despite years of announcements. For example, approximately four years after DEC announced "that magic alliance" with Apple Computer, Inc., the companies have done "nothing spectacular" to integrate Macintoshes and DEC platforms, he said.

Indeed, several sources suggested that by trying to encompass so many LAN environments with Pathworks, DEC may end up with a bevy of partial solutions.

"As DEC brings out [additional Pathworks products], we will try it" as a way to integrate a variety of LAN systems, said Mark Roy, a consultant of network operations at John Hancock Financial Services.

Both DEC and IBM are trying to convince users that they — and not Novell or Microsoft — offer the best enterprisewide E-mail, file-sharing and database sharing solutions, with the goal of eventually making "the NOS a nonsequitur so it doesn't enter into the enterprise equation," Dzubeck said.

DEC's announced agreement with Microsoft to incorporate Pathworks directly into Microsoft's Windows New Technology (NT) client/server product will further that intent, be added. Windows NT will potentially enable workstations to share resources directly, without the intervention of a network operating system.

What DEC needs right now is to build momentum by signing up some big corporate customers, sources agreed.

Hughes Aircraft Co., a major DEC user, has historically integrated its own vast assortment of LANs, according to Mike Ulvestad, head of microcomputer and LAN consulting at the aircraft manufacturer.

"I'm not exactly sure we would consider DEC as the integrator of choice if we were looking [because] this is a new area for them, and I'm not exactly sure how experienced they are," Ulvestad said.

Senior writer Sally Cusack contributed to this story.

For the pickin'

DEC's Pathworks seeks to be all things to all LAN users. The platform promises to link various clients to a mix of DEC and non-DEC servers, across local- and wide-area networks. Below are existing and planned Pathworks elements:

- **Services provided:** E-mail, including X.400-compatibility (optional); file- and printer-sharing; access to SQL databases; and compound document architecture.
- **Servers supported:** DEC's Ultrix, VMS, OS/2, OSF/1*, Microsoft's NT* and the OSF's Distributed Computing Environment (DCE)*.
- **Network operating systems supported:** Microsoft's LAN Manager, Apple's AppleShare and Novell's NetWare*.
- **Clients supported:** Windows, DOS, OS/2, Macintosh, NT* and DCE*.
- **Transport protocols supported:** Transmission Control Protocol/Internet Protocol, Novell's IPX*, NetBIOS, AppleTalk, Netbeui, OSI*.

*DEC has said it will provide these later.

Client/server effort aided by start-up's tools

BY JOANIE M. WEXLER
CW STAFF

NEEDHAM, Mass. — Companies struggling with client/server application development expressed relief over software tools announced last week from a start-up that has quietly built a stable of satisfied customers.

Firms using Horizon Strategies, Inc.'s software said the tools address a deficit of in-house programming expertise with multiple communications protocols and operating systems. They cited this as a stumbling block to building applications that span heterogeneous networks and computer platforms.

Horizon's Message Express masks the complexity of having to use different programming verbs to access data residing across a mix of systems. The tools combine the four distributed computing functions — file transfer, SQL, Remote Procedure Calls and messaging — with an application programming interface (API). The API reduces the complexity of disparate protocols to four common verbs, freeing programmers from communications coding.

Three-year-old Horizon's customers include the Munich Reinsurance Co. of Canada, New York Power Authority, a large paper manufacturer and a mid-size bank.

Munich Reinsurance has developed a prototype for its customers to file insurance forms electronically. "We would not have been able to develop it in the form we wanted without Message Express," said Peter Walker, vice president of electronic data processing and systems at the Toronto-based firm.

Walker said his developers are Cobol programmers who have "no idea" about network protocols. The insurance company installs its personal computers in a customer site, where the client fills out a form electronically. Message Express structures the document into the insurance company's format, then dials up its mainframe and sends it without the programmer having to worry about the transport scheme.

New York Power sliced off several months of training and development time with the tools in order to meet a materials maintenance application deadline. Running on a Data General Corp. Aviion platform in the utility's nuclear plants, the system needed to pass work orders up to the utility's financial application on an IBM 3090. "The only way for the two machines to communicate is LU6.2," said Steve Maydan, manager of applications support of financial systems at the White Plains, N.Y.-based firm.

Quick migration

Maydan said installation and training with Message Express took less than a week. If the firm had programmed using the 32 LU6.2 verbs, he said, "it would have probably taken months."

A large Boston-based process manufacturer said it saved a year in bringing an order-processing application on-line across IBM and Digital Equipment Corp. platforms using Message Express. The accelerated development has had a "tremendous effect on our credibility with outside customers," said the firm's chief information technology officer, who asked that his company not be identified.

"It's almost as if we outsourced a piece of the work," the executive said, adding that he has saved a man-year of development and related costs since last summer.

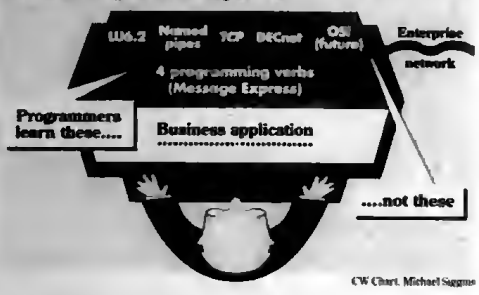
Systems maker DG remarkets the Horizon product. Joe Clabby, manager of communications products, said one of his banking customers used Message Express to write automatic nighttime file backup applications from an Aviion server to a mainframe and that "any programmer with basic skills" can use the tools.

Credibility-wise, Horizon President Hub Vandervoort said he is taking "every opportunity to conform to standards." He is considering product versions that hook into the Open Software Foundation's Distributed Computing Environment, the Object Management Group's Object Request Broker and naming services.

Meta Group, Inc. in Westport, Conn., receives phone calls every day from firms seeking client/server development tools, according to Aaron Zornes, vice president of applications development strategies at the consulting firm. "Many of these companies are ahead of the technology curve. When that happens, you have to build tools yourself or acquire them from a small niche player," he said.

Semantical cover-up

Developers will need to know only four verbs to build distributed applications using Horizon Strategies' tools



CW Chart. Michael Suggins

Apple to license System 7.0 add-ons

BY JAMES DALY
CW STAFF

NAPA, Calif. — The once unimaginable will become very real later this year at Apple Computer, Inc. when the king of the proprietary operating system begins licensing new technological components to System 7.0.

But the question of how much of Apple's crown jewels should be up for sale has become a subject of hot debate among Chairman John Sculley and his key lieutenants. At a rare Apple strategy briefing held here last week, Sculley called it unlikely that the entire Macintosh operating system would be made available.

Others left that door ajar. "It would be technically possible to license out the whole thing," said Apple Vice President Roger Heinen. "In hindsight, perhaps we already should have." Added President Michael Spindler: "We want to open up as much as we can."

The Quicktime multimedia extension will be the first System 7.0 component that Apple offers for general personal computer consumption. A developer's kit for creating Quicktime applications for systems running Microsoft Corp.'s Windows is expected by December, according to product manager Doug Camplejohn.

Apple's strategy spells good news for DOS or Windows users who have jealously eyed their co-workers' Macintosh. "We'd love to be given the freedom of choice," said Katherine De Bruyn, MIS director at the Perkins Coie law firm in Seattle. "But it depends how Apple does their implementation. . . . We have a considerable investment in Windows, and we'd need a convincing argument to start mixing Macintosh components in."

Apple's system software team also offered tantalizing glimpses of future Macintosh technology, including pen input capabilities and a rudimentary voice-recognition system called Casper.

Taligent fears

The meeting was designed to cool growing concern that the Cupertino, Calif.-based firm may sacrifice the long-term future of the Macintosh operating system in favor of a new object-oriented system it is developing with IBM through joint venture Taligent, Inc.

Sculley offered assurance that Taligent's system will be geared toward large businesses looking to write mission-critical custom applications easily.

Apple has also been trying to stop developers from focusing research dollars on the potentially more lucrative Windows 3.0 platform. The Windows 3.0 interface, which offers more than 60 million DOS users many of the graphical ease-of-use characteristics once available only on the Macintosh, has sold nearly 10 million copies since its May 1990 debut.

"The success of Windows is killing Apple," said William Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "If Apple had licensed out their OS three years ago, a lot of the Windows business could have been theirs."

Mac software goes modular

Apple has launched a modular system software strategy that will provide for a steady stream of new technologies that can be bolted onto the System 7.0 foundation on an as-needed basis. Each new system component is likely to be released separately during the next two years, but Apple will issue a periodic "reference release" that gathers together all of these extensions. The technologies include the following:

- **Quicktime** — A multimedia package said to make the integration of sound, video and animation into Macintosh applications more affordable and accessible. It was released in late December.
- **Open Collaboration Environment (OCE)** — Uses sophisticated messaging and mail techniques to smooth application interaction. It will also be able to encode and authenticate documents using digital signature technology from RSA Data Security, Inc. in Redwood City, Calif. The first components of OCE will be rolled out by year's end.
- **Scripting** — Will allow users to customize their Macintoshes more easily.
- **Imaging** — Future enhancements will be able to display three-dimensional images that can be rotated on the screen. The new software will work both with Apple's existing imaging software, QuickDraw, as well as Adobe Systems, Inc.'s PostScript.
- **Pen-based and voice recognition** — Macintosh-based system works with off-the-shelf applications.

JAMES DALY

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Fujitsu points super CPU at U.S.

Firm targets commercial rather than government users

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Fujitsu Ltd. reentered the U.S. supercomputer market last week, saying it would sell standalone, Unix-based vector processors directly to commercial end users.

Fujitsu's VP 2000 processors are available immediately, with delivery expected in four to six months, said Thomas Miller, vice president of sales and marketing at Fujitsu America, Inc.'s SuperComputer Group in San Jose, Calif.

Vector processors carry out high-speed computations on vast arrays of data points generated by scientific research, such as weather patterns, seismic data and airflow over jet wings.

The 10 models of the VP 2000 supercomputer offer performance ranging from 0.5 to 5 billion floating-point operations per second and come with memories of up to 2G bytes, according to Fujitsu.

The VP 2000 runs UXP/M, which is based on Unix System Laboratories, Inc.'s Unix System V Release 4 operating system. Fujitsu will make available more than 100 off-the-shelf applications that have been ported to UXP/M.

Rays reflecting *off the earth, as captured by the VP 2000*

Among these products are the following: Ansys, a structural and mechanical engineering analysis package from Swanson Analysis Systems, Inc. in Houston, Pa.; Fidap, a fluid dynamics program from Fluid Dynamics International in Evanston, Ill.; and Discover, a computational chemistry package from Biosym Technologies, Inc. in San Diego.

Fujitsu is targeting commercial accounts rather than top U.S. national research laboratories and government agencies, which are among the largest supercomputer users.

"The commercial market is not dependent on public funding, so there is not that sensitivity to [buying systems from] vendors from other countries," Miller said.

"It's a prudent strategy for Fujitsu to go after the commercial market," said Gary P. Smaby, president of Smaby Group, Inc. in Minneapolis. "Trying to sell to the [U.S.] defense agencies that get DARPA funds makes no sense."

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Covia, Galileo join CRS forces

BY ELLIS BOOKER
CW STAFF

AMSTERDAM — Two of the world's largest computerized reservation operators agreed to merge last week and create what they said is the first global computer reservation system (CRS).

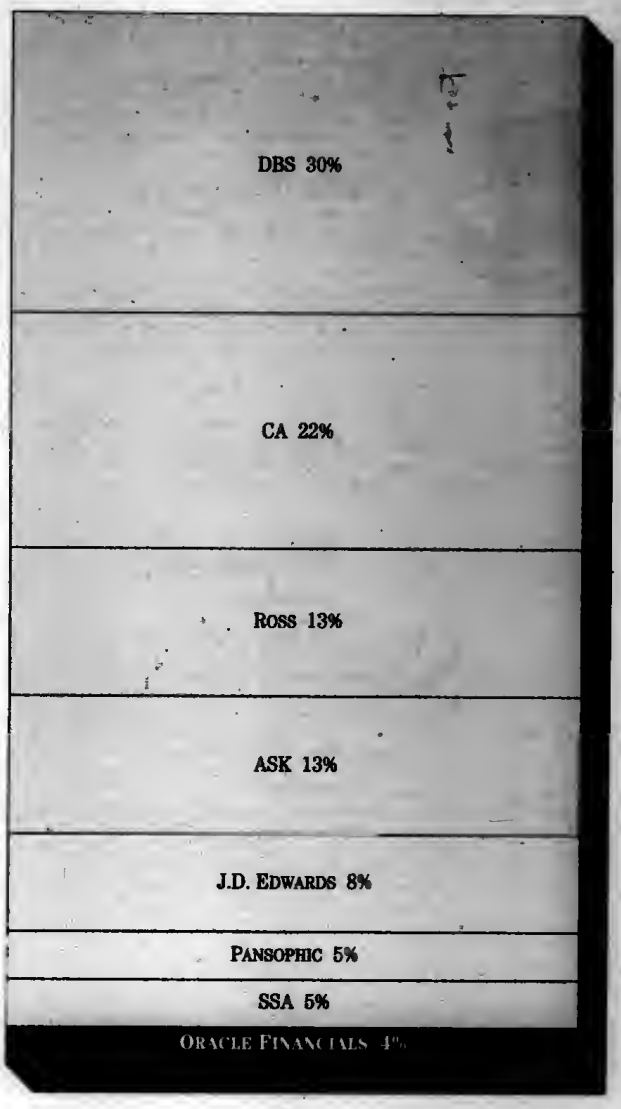
Covia, the former United Air Lines unit that developed United's Apollo CRS, and Galileo, the CRS owned by a consortium of European carriers, said they hope their impending partnership will seize competitive advantage from market leader Sabre — the American Airlines CRS — which is also expanding globally. Galileo International, as the company will be called, is expected to serve some 25,000 travel agencies worldwide, compared with Sabre's 22,000 locations (excluding American's own agents).

The two CRSs have had close business and technology ties for years. For example, Galileo's CRS was based on Covia's Apollo. Five of the seven airlines that are partners in Covia hold an 88% equity in that company and also a 90% stake in Galileo, which has 10 airline partners total. Galileo International's CRS plans to provide a single database for reservations, schedules, fares and availability data.

"The benefits are accuracy, timeliness, completeness and consistency," said Bob Mann, vice president at SH & E, Inc., a transportation consulting firm.

A Sabre spokesman said his company does not fear Galileo International. Sabre, which operates in 57 countries on six continents, is flying solo in the European arena after backing away last fall from a joint venture with the other pan-European CRS, the Amadeus Global Travel Distribution System.

THE FINANCIAL SOFTWARE MARKET HAS JUST BEEN TURNED UPSIDE DOWN.



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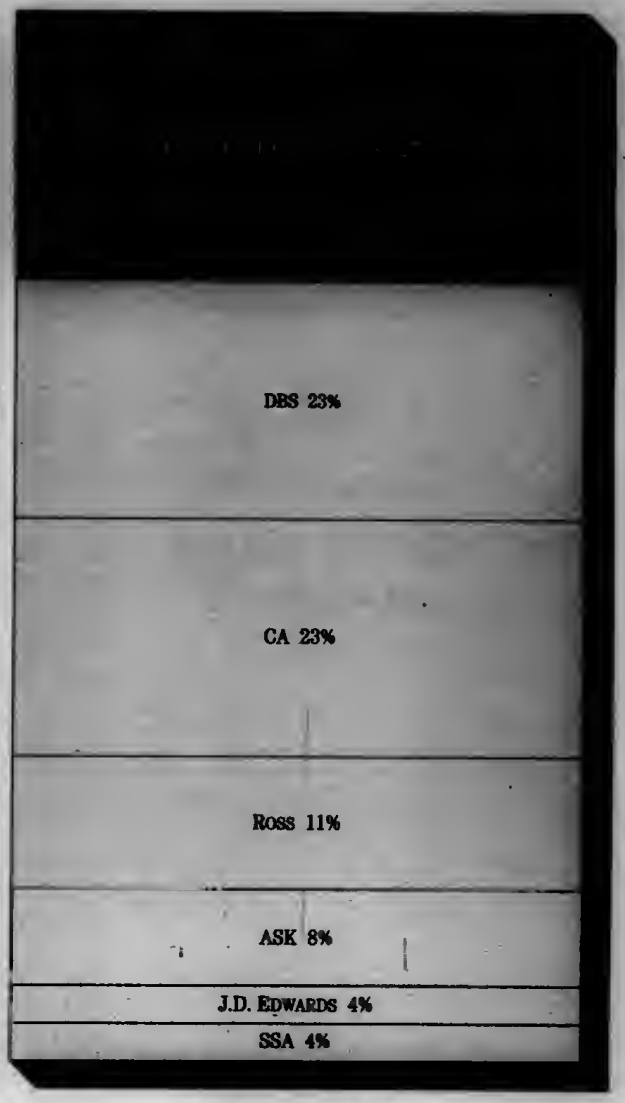

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KnowledgeWare details Unix strategy

BY KIM S. NASH
CW STAFF

ATLANTA — Users generally yawned at KnowledgeWare, Inc.'s Unix strategy — rehashed here at last week's annual user conference — in part because there are no products to support it yet. Many, however, are applauding the company's new graphical user interface (GUI) builder despite its late entry to the field.

The as-yet-unnamed Unix product line — which was initially disclosed at the company's user group meeting one year ago — will run on Unix and generate applications for that operating system, said Peter Privateer, vice president of strategic product planning.

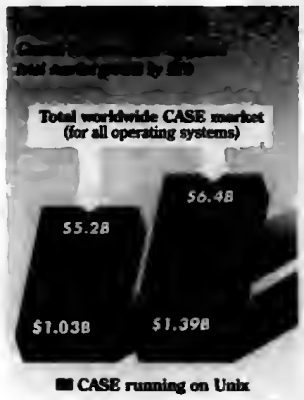
Instead of porting its flagship OS/2-based Application Development Workbench (ADW) to Unix, KnowledgeWare plans to build a new suite of computer-aided software engineering (CASE) tools to run on a variety of Unix platforms, Privateer said.

Possible target systems are Unix reduced instruction set computing platforms from Sun Microsystems, Inc., Hewlett-Packard Co. and IBM, which has a business partnership with KnowledgeWare for AD/Cycle development. It is unclear whether KnowledgeWare will work with IBM on the Unix effort, but Privateer said the new workbench will be compatible with IBM's recently announced AIX-based CASE strategy [CW, Feb. 17].

Apathetic response

The Unix plans are "nice to know about, but we're really not interested right now," said Saiid Razavi, an information strategist at U.S. Sprint Communications Co. in Kansas City, Mo.

Privateer gave no time frame for delivery of the Unix line but said a new GUI builder is slated to ship in June.



Source: Dataquest, Inc. CW Chart: Michael Siggins

In April, select users will beta test ADW/Construction-GUI (ADW/CWS-GUI) Workstation, a long-awaited add-on to its flagship ADW tool set.

Privateer claimed that along with user interfaces, ADW/CWS-GUI can also help build cooperative processing applications that access three kinds of servers: personal computer, IBM Application System/400 and IBM Enterprise System/9000 mainframes.

Users generally welcomed the news, but some said they wondered why the CASE vendor waited until now to unveil it. KnowledgeWare brings up the tail end of the GUI-builder march during which competitors such as Texas Instruments, Inc. and CGI Systems, Inc. released interface tools months ago.

"It looks like a good product, but we could have used this months ago," said Kitty Burgmans, a computer systems analyst at Southern California Gas Co. in Los Angeles.

"Ours is more functional. It does more than make a pretty picture," Privateer said, referring to the product's ability to generate systems in which application logic is distributed between PCs and host computers.

Baby step

The GUI tool will let users take a conservative step into cooperative processing, said Aaron Zornes, an analyst at Meta Group, Inc., a consulting firm in Westport, Conn.

Instead of newfangled, object-oriented languages typically associated with cooperative application development, the product generates Cobol and CICS applications, which are the foundation languages for the majority of users in the U.S. "It's a low-risk move for most shops," Zornes said.

ADW/CWS-GUI will initially support only OS/2 clients, but an MS-DOS version is planned by the end of 1992. Pricing was not disclosed.

Users dismiss fast 486 chip due to limited systems fit

CONTINUED FROM PAGE 1

price/performance features of the chip maker's CPU family.

The dual-speed chip accesses secondary chips at a clock speed of 25 MHz, while its inner workings clock in at 50 MHz. DX2-based systems will likely cost slightly less than machines designed around the 50-MHz, I486DX 50 chip, its close cousin.

Others pointed out that only users of the 486DX can upgrade to the DX2, which excludes the majority of today's systems. Hence, they saw little reason for the hoopla.

A spokeswoman for Intel said that depending on a PC's configuration, the new chip may require a heat dissipator in some situations, similar to the more power-hungry and heat-generating 486DX and SX.

For William Johnson, a senior microcomputer systems analyst at San Diego-based Washington Inventory Service, having to add a component to take the heat off would obviate any speed benefits. "That would be a deterrent," he said. "Going a little faster would not be as necessary."

Intel's positioning of the chip also raised some eyebrows because users cannot plug the DX2 chips into their 486SX boxes. It also cannot be added into 80386-based systems, which along with the 286, make up the bulk of the installed base of PCs.

While Intel claimed that the new addition simplifies users' upgrade strategies, Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass., said the Santa Clara, Calif.-based chip manufacturer and its disciples will have to put some serious effort into explaining the strategy to users. "I can't buy that," Zwetchkenbaum said. "If you look at the watch long enough, maybe you'll be hypnotized."

Yet another option

For the 486SX, which constitutes 1.6% of the Intel and Motorola, Inc.-based PC market, Intel is offering an alternative. Called the Overdrive, end users can plug the chip into the same socket used by math coprocessing chips, which will boost the machines from 20- to 40 MHz.

But according to one Intel source, the Overdrive and DX2 chips "are functionally the same," which raises the question of why the DX2 chip cannot be plugged into the 486SX.

The answer is simple and annoying to some users: Intel purposely put a different pin pattern on the bottom of the DX2 so that it could sell the same chip into two different markets, Intel and other PC vendors said.

Mark Cash, marketing manager at Milpitas, Calif.-based PC maker Twinhead Corp., characterized the move as "really very clever marketing."

Many observers looked at the announcement in the same vein. The new chips will keep Intel ahead of such competitors as Advanced Micro Devices, Inc. and Chips and Technologies, Inc. However, many of them said that the DX line, along with the 17 available versions of other 386 and 486 chips, gives competitors too many bouncing balls to follow.

Mostly complications

"I do find it confusing," said Juliette Coddington, assistant vice president at Hamond & Co., an insurance company in Lake Success, N.Y. "Trying to explain the [chip] differences to upper management is hard enough now."

It strikes some IS managers as being window dressing. "It's like 20 years ago in the car industry when Detroit found out they could put different trim on cars and put out 15 different models," said Bob Flegal, a mining engineer at BHP Minerals, Inc. in San Francisco.

Flegal said lower costs would not win him over. "At least for the corporate buyer, price differences are not great enough to be a factor."

Moreover, most of those interested in a 486 system said that any use they might find for such a chip was at least a year down the road, adding that 33-MHz 486s more than met their current needs.

"I can't see it making an impact on what we're doing for at least a year," Coddington said.

PC parade

Some of the 25 vendors announcing plans for the DX2 and other unveiled products include these companies:

Compaq Computer Corp. — Announced the DeskPro 50M with QVision graphics controller. It has three models ranging from a diskless model to a 340M-byte hard drive box. Prices range from $4,299 to $6,199. Systempro/LTs: three models, with 210M and 510M bytes, as well as an Intelligent Drive Array model with a 1,020M-byte drive array, costing $8,199, $9,799 and $12,899, respectively.

Dell Computer Corp. — Released four models, ranging from a 4M-byte random-access memory, 100M-byte hard drive model for $2,799 to a floor-standing Extended Industry Standard Architecture box with a 230M-byte drive for $6,599.

NCR Corp. — Unveiled a workstation with small computer systems interface controller, Super VGA, 4M to 16M bytes of RAM and a hard drive from 100M to 340M bytes. Pricing not yet available.

Tandy Corp. — Announced the Tandy 4850EP, a $2,699 XT/AT bus-based desktop system.

Wyse Technology, Inc. — Unwrapped the Decision 486/50DX2. Configurations range from a diskless model with 2M bytes of RAM to a 300M-byte enhanced small device interface hard drive model; availability is next quarter.

CORRECTIONS

An article in the Feb. 10 issue concerning Digital Equipment Corp.'s VMS Posix 1.0 should have stated that the product will allow software developers to write a single application capable of running VMS, Unix and other operating systems *without* modification.

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The Inside Lines column in the March 2 issue erroneously referred to a 68040 microprocessor made by Intel Corp. Motorola, Inc. builds that part.

••••••••••

The phone number given in the Feb. 17 calendar listing for the Fifth International Computer Virus and Security Conference that takes place this week at the Loew's New York Summit Hotel was incorrect. The correct number is (800) 835-2246, ext. 190.

••••••••••

In the March 2 issue, photos of Evan Wride and Chuck Decker accompanying an In Depth article were transposed.

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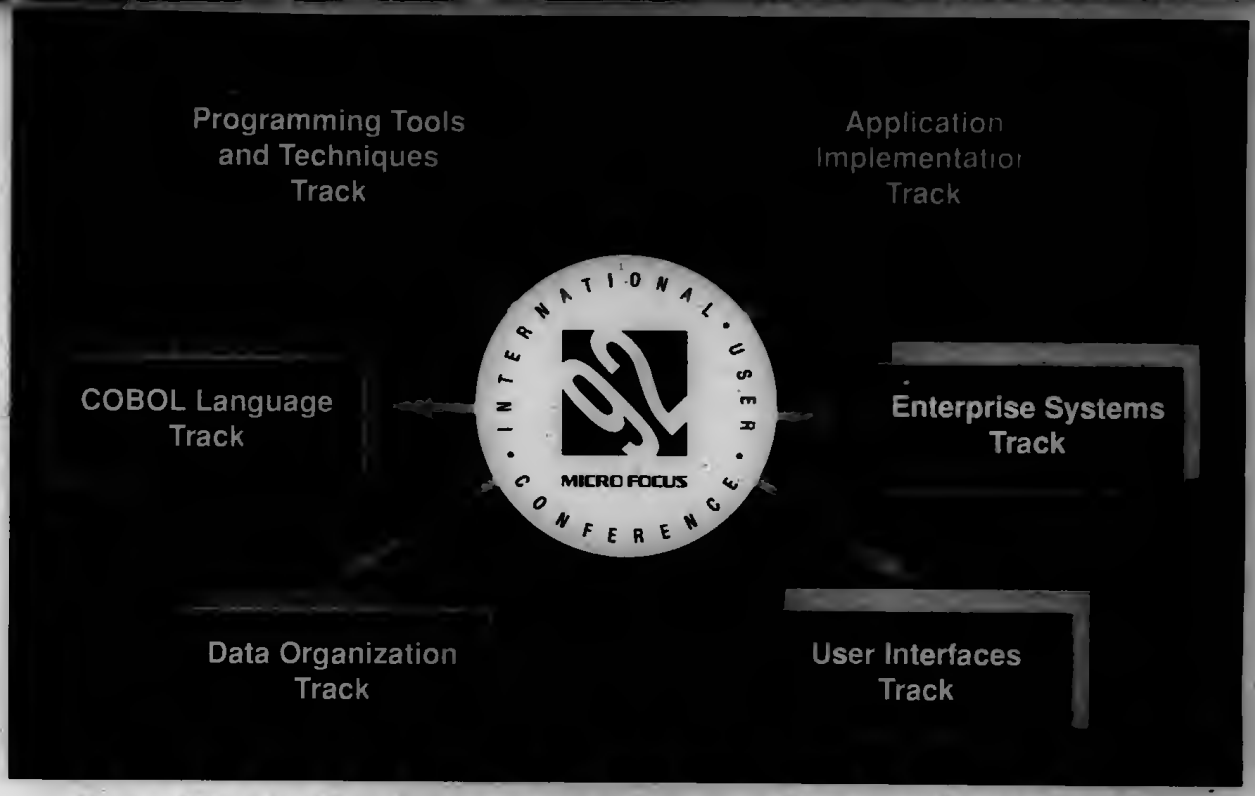
Ensemble Corp., which makes Command Center for Paradox, is in Dallas. No location was specified in a Shorts item in PCs & Workstations [CW, Jan. 13].

••••••••••

J. D. Edwards, a leading Denver-based provider of integrated minicomputer accounting software for the IBM Application System/400, was excluded from a product listing in the Feb. 24 Product Spotlight. The company's phone number is (303) 488-4000.



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NEWS SHORTS

Technology cuts off AT&T operators

AT&T said it will cut up to one-third of its 18,000 long-distance operators and close 31 operator services offices by 1994 through the use of voice-recognition technology. The technology will allow AT&T to process many calls, such as collect calls and those billed to third parties, without a human operator. Four out of five customers reportedly rated the voice-recognition technology as "good" or "excellent" during a pilot.

Glitches halt two trading systems

A unknown glitch stopped a test of the Globex futures trading system at the Chicago Mercantile Exchange and Chicago Board of Trade last Tuesday. The test, the 10th and largest to date, involved 250 workstations operating worldwide. Separately, trading at the Toronto Stock Exchange (TSE) was halted for four hours that day when its trading system began scrambling orders wildly. The problem was triggered by faulty logic that popped up in a trading application because of weekend modifications. The outage lowered TSE's usual volume by about 5 million to 6 million shares. Meanwhile, volumes at the Montreal Stock Exchange doubled the same day. TSE plans to use an entirely computerized trading floor by next year.

Ruling gets Prime off the hook

Prime Computer, Inc. was cleared of antitrust violations last week when a U.S. Court of Appeals in Bedford, Mass., reversed a lower court ruling and ordered that court to enter judgment in favor of Prime, which was sued in 1989 by Virtual Maintenance, Inc. The suit concerned Prime's service policies for PDGS, a software design program developed by Ford Motor Co. and marketed exclusively by Prime with its 50 series minicomputers. Prime will not have to pay the $25 million in damages originally awarded to Virtual.

Russians say Nyet to piracy

The Russian parliament will enact its first software copyright law in the next few months, which is a dramatic change for a country with rampant software piracy, according to Leonid P. Malkov, an executive at Moscow's biggest software company, ParaGraph JV. During a U.S. visit last week, Malkov said the law won preliminary approval from the parliament last month and is supported by the newly formed Association of Software Publishers in Russia. Instant enforcement would produce "the nightmare of millions of infringers overnight," he said, so it will be either delayed or relaxed for current users of pirated software.

Awards target information pros

Carnegie Mellon University's Graduate School of Industrial Administration and American Management Systems, Inc. are seeking nominations for the Fifth Awards for Achievement in Managing Information Technology. Awards go to senior information executives and professionals who have made "outstanding contributions" to their companies through effective use of information technology. Nominations made by chief information officers and other top executives are due by May 15.

Short Takes

IBM has purchased an undisclosed equity position in Red Shark Technology Corp., a maker of multimedia software developers. . . . Dun & Bradstreet Software unwrapped a Service Partner Program that includes national service agreements with Cap Gemini America, Deloitte & Touche, Ernst & Young and Price Waterhouse. . . . As of April 24, New York Telephone hopes to be the first regional operating company to provide a commercial frame-relay service. Pending regulatory approval, it plans to introduce the service throughout the downstate New York area by April 24. . . . Object Design, Inc. has inked a licensing pact that enables IBM to use ObjectStore to build RISC System/6000-based electronic design framework applications, and a suite of integrated applications for use by IBM designers.

More news shorts on page 16

Carriers sign mutual aid plan

New York area will have communications within two hours of an outage

BY ELISABETH HORWITT
CW STAFF

NEW YORK — After being hit with two major AT&T outages in the past year, New York City is fighting back with a plan to have local- and long-distance carriers back each other up during a major network outage.

Thirteen carriers last week signed a mutual aid plan that should ensure that the greater New York area regains basic communications services within two hours after a major network outage, according to Joseph J. Walter, a vice president of telecommunications at The Chase Manhattan Bank NA and a co-chair of the Task Force Mutual Aid Subcommittee. "It means quite a lot to the user community here — both residential and business," he said.

Instigated by William F. Squadron, commissioner of the City Department of Telecommunications and Energy, the mutual aid plan was formally announced last November.

Thirteen sign on

Among the participants are the three major long-distance carriers, MCI Communications Corp., AT&T and U.S. Sprint Communications Co.; New York Telephone Co.; New Jersey Bell Telephone; and several local- and long-distance alternative access carriers.

The safety net provided by the carrier consortium was not designed to replace backup and recovery systems now in place at many major New York financial and service firms, Walter said. Rather, the system will provide "a backup of the backup" that will help such businesses restore full service faster, he said. Few companies can afford to provide full redundancy for backup services, and so many have experienced at least some interruption or degradation of services during a major outage, Walter said.

Now that the basic plan is in place, the task force will work on technical issues that must be resolved before mutual aid backup service reaches its full potential, carrier spokesmen said.

One major question is how to provide adequate backup for AT&T, which handles between 62% and 64% of long-distance traffic, an AT&T spokesman said. Backing up a major AT&T cable break would mean diverting customer transmissions to several alternative carriers, a task force spokesman said.

The task force is also working out ways to speed up the cutover from the failed link to backup resources through automation, according to Jonathan Crane, president of MCI's Eastern division. The current process involves the commissioner's office's determination that a major failure has occurred and then notification of the appropriate carriers either by broadcast fax or "hoot and holler" voice messages, he added.

One serious obstacle to automating response to a network outage is the lack of an industry standard for interfacing the carriers' respective network management systems, Crane said.

Another major drawback of the current setup is that it can only handle backup for cable cuts, Walter said. Another task force is just beginning to address the more complex switching center failures, such as the one that hit AT&T's lower Manhattan office last fall, he added.

The plan targets major outages on carrier backbones, not minor cable breaks, Walter said.

Recession alters market, triggers Comdisco revamp

BY NELL MARGOLIS
CW STAFF

ROSEMONT, Ill. — Hard hit by the recession and sitting astride a series of rapidly changing markets, Comdisco, Inc. said last week that it will hedge its bottom-line bets with a $48 million after-tax charge to earnings for its second fiscal quarter, which ends March 31.

It will be allocated in three directions, according to Robert Bardagy, Comdisco's marketing vice president: $25 million to beef up an already established receivables reserve; $35 million to fund a corporate restructuring; and $20 million to defray litigation costs, most notably those expected to accrue in the course of the year-old IBM/Comdisco leasing litigation.

The whopping charge — $80 million calculated on a pretax basis — could send Comdisco's second- quarter profit plunging as much as 50% in the year-over-year comparison, to approximately $12 million.

However, Bardagy said, the bullet is worth biting if the measures funded by the charge protect the firm from defaults by bankrupt customers — Zale Corp., R. H. Macy & Co. and Pan American Airlines are just three of the major Comdisco users that have filed for Chapter 11 protection in recent months — and position it for a quicker bounce-back when the economy starts to improve.

Preparing for the future

The corporate reshaping now afoot — a multipart plan that could save Comdisco an estimated $60 million by the end of fiscal 1993 — edges the firm away from its less profitable businesses while poising it for renewed forays into more promising turf, Bardagy said.

The reorganization includes, among others, the following moves:

- Comdisco will exit the Cray Research, Inc. and Data General Corp. leasing markets.
- Three separate sales forces now serving Comdisco's core leasing, disaster recovery and consulting businesses will become a more unified sales corps.
- The firm will further hone an already sharpened focus on the international market. According to Bardagy, some 30 international customers are now using Comdisco's year-old Global Master Lease Agreement, an arrangement that lets a user take advantage of leasing opportunities all over the map without having to reinvent the leasing wheel under local law every time it finds the right box in a foreign country. This year, Comdisco said, it expects the number of accounts signed up under the program to double.
- Comdisco will further explore management and consulting opportunities such as that exemplified by its Comdisco Facilities Asset Management (CFAM) program, an insourcing initiative under which Comdisco will take over a client's hardware management chores, leaving the rest of the user's information systems department in place to focus on product strategy and development.

The fledgling CFAM has already injected some $120 million to $200 million to Comdisco's coffers, according to Bardagy.

The reorganization will eliminate some 10% of Comdisco's 2,000 jobs worldwide. Across-the-board layoffs are expected to be announced within 60 days.

"THE TASK IS TO INTEGRATE THE OLD AND THE NEW."
SYBASE
CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Personal data goes public

CONTINUED FROM PAGE 1

Campbell said there is little evidence of a corporate problem so far, but he said creditors and health insurers are very hungry for personal financial data to supplement credit bureau reports. "They'll get it any way they can to avoid making costly loan or insurance mistakes," he said.

According to Campbell, information brokers could hire "dumpster divers," computer hackers or insiders to get highly marketable information. However, at a time of massive corporate layoffs, the biggest threat may be departing employees who walk out with a diskette of vital information, he said.

Last December, federal grand juries in Florida and New Jersey indicted 23 people, including eight information brokers and several SSA employees, for buying and selling confidential information held in government computers. The ring included police officers who sold criminal histories from the National Crime Information Center (NCIC) database.

Evan D. Hendricks, editor of the "Privacy Times" newsletter in Washington, D.C., said the indictments are "most likely the tip of a very ugly iceberg," and he expects more cases will follow.

There have been several people indicted in recent months, such as the Virginia state police officer who allegedly sold criminal history checks for $200 each and an Internal Revenue Service official who allegedly sold confidential information.

The ultimate buyers of the SSA and NCIC information have not yet been identified, but Moynihan said they apparently include private investigators, prospective employers, lawyers and insurance companies. The information is used for "locating people or making decisions on hiring, firing, suing or lending," testified Larry D. Morey, deputy inspector general at the U.S. Department of Health and Human Services, the parent agency of the SSA.

Investigators were tipped off by a sales brochure from Nationwide Electronic Tracking (NET), an electronic information broker in Tampa, Fla., which promised fast access to confidential information.

NET's principals agreed to plead guilty to illegal disclosures of federal information and then cooperate in a sting operation. Officials planted names in the black market and then used a computer audit trail to catch SSA employees who made queries for those names, Morey said.

Morey said brokers typically have one or more SSA employees "under contract" and pay $25 for each earnings history. Another technique, called "pretexting," is to get the data by phone after claiming to be an SSA employee from another office where the computer is down.

SSA officials said their on-line records are adequately protected from unauthorized access, but it is hard to stop authorized users from accepting bribes to disclose information. The SSA does use Computer Associates International, Inc.'s Top Secret to control employee access to particular mainframe files on a need-to-know basis, but the indicted employees were authorized users of the files in question.

The SSA called for tougher penalties for disclosures and issued a special bulletin on confidentiality to its employees, advising them not to "obtain or release information about celebrities, sports figures, friends, relatives or co-workers for non-program purposes."

Dossiers for sale

A 1990 sales brochure from Nationwide Electronic Tracking in Tampa, Fla., provides the following price list for obtaining confidential information

With name and address, will conduct nationwide search for Social Security number: **$10, in two hours.**

With name and Social Security number, will obtain recent places of employment and subject's earnings (last 10 years): **$175, in three to five days.**

Subject's credit history: **$10, in one to two hours.**

Subject's criminal history: **$100, in one week.**

With subject's name and address, will obtain names, phone numbers and addresses of up to nine current neighbors: **$10, in one to two hours.**

CW Chart: Janell Genovese

Security group emerges

IISF to boost awareness and provide guidelines

BY MICHAEL ALEXANDER
CW STAFF

MENLO PARK, Calif. — Several business and trade organizations have teamed up to form an association to help raise computer security awareness and advocate responsible computer systems management and use.

The International Information Security Foundation (IISF) proposes to develop and lobby for "generally accepted system security principles," a basic set of security-related management and technical principles aimed at commercial computer users.

Promoting the principles and raising funds for the nonprofit group will be among the group's first missions, according to Martin Ennis, manager of information technology at the American Software Association, which is a division of the Information Technology Association of America (ITAA).

ITAA is one of the members of the working group that helped launch the new organization. Other members of the working group include the Information Systems Security Association, AT&T's Unix System Laboratories, Inc., Digital Equipment Corp. and IBM.

The group will also seek to establish a security incident database, which will be used to track security breaches, serve as a clearinghouse for security methods and evaluators and collaborate with other groups on international evaluation criteria and standards.

IISF is being patterned after a similar organization first proposed in a National Research Council study titled "Computers at Risk: Safe Computing in the Information Age."

The organization is beginning its operations with a small staff, which will operate for the near term from SRI International here until a permanent home is found, Ennis said.

Host software pricing gets murky

CONTINUED FROM PAGE 1

Legent Corp. in Vienna, Va., in October.

- Per-user and concurrent-user models, introduced by Digital Equipment Corp. in October 1991. More options, including one that allows users to transfer their software licenses to non-DEC hardware platforms, will come in the next few months.

EVENTUALLY, TECHNOLOGY WILL allow a true metered approach, which would bill users based on the connect time or the actual work done with the software.

- Partition-based pricing and discounts for multiple operating systems and related utilities that IBM is likely to detail during the next six months [CW, March 2].

Other vendors are looking into different pricing schemes but have not yet reached a decision, including Computer Associates International, Inc. in Islandia, N.Y.; Systems Center, Inc. in Reston, Va.; and Candle Computer Corp. in Los Angeles.

Still others, including Boole & Babbage, Inc. in Sunnyvale, Calif., and Goal Systems International, Inc. in Columbus, Ohio, plan no major changes to their tiered-pricing structures for mainframe software, executives said. Effective March 1, Boole went from a three-tier model to one that is based on eight tiers, a spokeswoman said.

Complicating the pricing issue is that users do not necessarily speak with one voice. Some customers think tiered pricing is inherently unfair, while others do not mind it. Of those who want a change, some said they would prefer a pricing structure based on different classes of software; others said their motto is to keep it simple.

Pricing based on CPU cycles "gets crazy," said Robert Spicer, chief information officer at Chevy Chase Federal Savings Bank in Chevy Chase, Md. "I've got 30 different vendors in here. Am I going to have to give them a meter reading every month?"

Tiered pricing is "good enough," Spicer said. "The CPU size is a reasonable measure of the amount of work being done, which is a reasonable measure of the value it provides. Nothing's perfect."

"Tiered pricing forces us into unnatural positions," said James Matsey, corporate director of information systems at Reynolds Metals Co. in Richmond, Va. For example, he said, Reynolds recently looked at putting a communications program on its Application System/400 Model D80, at a projected cost of at least $40,000 under IBM's tiered model.

The company opted instead for a personal computer running the same program. "That's not what I wanted to do because it means another piece of equipment to support," Matsey said. "But that's what tiered pricing does — it made me make an illogical decision."

Matsey said he would prefer a pricing model based on the business value received from the software. For example, he said, a customer who processed $5 billion of accounts receivable with a software package would pay less than a customer who processed $6 billion worth of receivables. Other users also like that approach, although they pointed out that administering and determining fair prices under such a scheme could be problematic.

Rino Bergonzi, vice president of information technology at United Parcel Service, Inc. in Mahwah, N.J., said he objects to any host-based metering software that would help keep track of use patterns. "I don't want to pay the machine resources of 2% to 5%" that any such record keeping would require, he said, noting that he prefers to "keep any new pricing structure simple." He and other customers said they would prefer to see a return to site licenses.

That does not seem to be what is happening. Legent, for example, is going to "produce customized price books" and "formalize certain discounts and price breaks," said Chuck Riegel, vice president of marketing. He also said Legent will offer perpetual licenses as well as annual ones.

BMC Software, Inc. in Sugar Land, Texas, is taking a different approach. "We don't deviate from our published price list," said company President Max Watson Jr. "It sounds inflexible," he said, but the alternative is "just plain unfair" when a company starts making special deals with customers.

Eventually, many observers agreed, technology will allow a true metered approach, which would bill users based on the connect time or the actual work done with the software. "The only issue is monitoring it, to measure the usage accurately and fairly" from both the vendor's and user's perspective, said Bob Djurdjevic, president of Annex Research in Phoenix.

In the meantime, both users and vendors can expect confusion as the options sort out. "Customers say that if the vendors all solve the problem differently, then we haven't really solved it," said Bob Fowkes, business development manager at DEC in Nashua, N.H.

CAD/CAM users seek better software integration

BY MARYFRAN JOHNSON
CW STAFF

CAMBRIDGE, Mass. — Find better ways to integrate data among computer-aided design, manufacturing and engineering software (CAD/CAM/CAE). That was the overwhelming message from users to vendors here at last week's industry-leading CAD/CAM/CAE conference.

"I don't want [CAD/CAM] suppliers to control my access to technology," said Gordon Willis, director of product and manufacturing systems at Ford Motor Co. in Dearborn, Mich. "What we're interested in is the ability to integrate a wide variety of technical products into our own environment."

Daratech, Inc.'s CAD/CAM/CAE Strategy Workshops '92 attracted some 350 hardware and software vendors, end users and assorted experts to discuss the top issues in this $7.5 billion industry.

"A lot of the old problems have not gone away," said Charles Foundyller, president of Daratech, a market research firm based here. "Customers are being promised open systems, but the vendors are edging toward them rather slowly."

To engineers, open systems means standardized, interoperable software modules and application interfaces — not just the ability to run on a Unix-based workstation. That kind of openness can only come through vendor partnerships and cooperation, according to several users.

"We're all moving from islands of automation to linking them, but getting everything to work together is the big problem," said Mary Hackler, an engineering associate at Mobil Research & Development Corp. in Princeton, N.J.

"No one vendor can supply the best of everything I want," Willis noted. "But I want them to make it easier for me to live with my current environment. We're spending too much money attempting to integrate products from multiple vendors."

At Ford, the CAD/CAM environment is split between two systems: the in-house-developed Product Design Graphics System and Computervision Corp.'s Computer-Aided Design and Drafting System packages. What manufacturers need, Willis said, are assurances of higher quality through rapid prototyping, improved work flow from design systems to plant floor operations and less reliance on paper and tooling aids.

"We ought to have a fun environment, with icons, ease of data transfer — anything that makes engineers more productive and more anxious to sit down and use it," said Sheldon Cousin, manager of CAE at Stone & Webster Engineering Corp. in Boston.

Along with a number of new solids-modeling packages on display, the most talked-about technology was the proposed ACIS standard from Spatial Technology, Inc.

ACIS is an object-oriented, geometric solids modeler that provides a unified environment for modeling curves, surfaces and solids.

System V to get broader functions

BY MARYFRAN JOHNSON
CW STAFF

PARSIPPANY, N.J. — Unix International, Inc. last week released the third edition of its annual Unix System V Roadmap, providing an updated schedule of requirements, specifications and details about future System V releases and integrated technologies.

Based on suggestions from vendors and organizations such as X/Open Consortium Ltd., the road map was expanded this year to include a broader range of requirements for transaction processing, distributed computing and systems management.

"The existence of the road map and the openness implied by it indicates we are dealing with a standard environment. That is critical to us," said Jim Brown, an information systems project manager at Kmart Corp. in Troy, Mich., which relies on a network of Unisys Corp. Unix systems, IBM Personal System/2s and Intel Corp. 80386-based personal computers.

The '92 road map includes new product releases of the base operating system, plus additional features scheduled for release later this year and into 1993-1994 for transaction processing, systems management and distributed computing.

Here are some of the highlights:

- SVR4.1DT for the desktop — A mid-1992 introduction of the "Unix Lite" operating system, compatible with Unix International's Open Look, the Open Software Foundation's OSF/Motif, The Santa Cruz Operation's Xenix SCO Unix and previous releases of System V. Also planned is support for MS-DOS and Apple Computer, Inc. Macintosh applications.
- SVR4.2 — An early 1993 release of a parallelized, multiprocessing implementation of System V, built on the SVR4.1 Enhanced Security base.
- Add-on components such as support for the OSF's Distributed Computing Environment in the first half of 1993.

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NEWS SHORTS

Getting more kicks from CICS

IBM last week announced a new version of the CICS/Enterprise Systems Architecture transaction processor, Version 3.3. New enhancements include a front-end programming interface for integrating CICS and IMS applications and improved support for client/server applications. The release will be available March 27, although some of the new components will not be available until later.

Here comes the SunSoft RPC

Sun Microsystems, Inc.'s SunSoft, Inc. subsidiary has unveiled a general-purpose Transport-Independent Remote Procedure Call Toolkit (TI-RPC) for client/server applications development. The $1,000-per-seat product — available initially for applications based on SunSoft's Solaris 1.0 operating system — takes an application's C language descriptions and generates the necessary TI-RPC code to allow programs to run across a heterogeneous network without concern for transfer protocols. Vendors such as Novell, Inc., Borland International, Inc. and Lotus Development Corp. have endorsed the tool kit, which is the first piece of a comprehensive networking strategy that Sun plans to introduce within a few months.

Sending out an SOS

An open systems user group called SOS, formed last summer, is one step closer to its goal of pressuring vendors into delivering standards-based systems sooner rather than later. SOS said it has persuaded a standards body — the Open Systems Interconnect Implementors' Workshop — to host a forum in which users and vendors can communicate directly, circumventing the usual red-tape-riddled process.

Price is right for Dell

You will soon be able to find Dell Computer Corp.'s personal computers among the giant bottles of Scope and cheapo racks of tires at your local Price Club. The Austin, Texas-based PC maker last week announced a distribution agreement with the warehouse club giant. Dell will launch a new line of U.S.-made boxes, the Precision family, aimed specifically at small offices and home buyers.

Don't wait until dark

San Francisco-based Berkeley Systems, Inc. has announced the 1992 After Dark Display Contest. Users can submit screen-saver entries for judging in three categories: Macintosh Programmer, Windows Programmer and Computer Artist. Winners in each category will win $2,500 shopping sprees for computer merchandise. A grand prize winner will receive $10,000. Think fast — the deadline for submissions is April 1. More information can be obtained from Berkeley Systems.

Big names back research center

Worcester Polytechnic Institute has opened the Center for High Performance Computing, which is devoted to developing scalable multiprocessing systems on behalf of federal government and corporate sponsors. A team of 25 computer scientists and product engineers is already exploring such technologies as distributed and real-time operating systems, high-density design and parallel programming tools. Among the center's sponsors are Encore Computer Corp., Mercury Computer Systems, Data General Corp. and the Open Software Foundation.

Short takes

Intel Corp. last week said it will contribute $76.9 million to its U.S. employees' deferred profit-sharing program for 1991.... Two dealers surfaced in copyright infringement cases brought by the **Software Publishers Association** (SPA) this week. **Creative Computer Consulting** has settled with the SPA, while the suit with **Consolidated Micro Services** is still ongoing. The SPA also picked up a $50,000 settlement from Cato Co. in North Carolina.

Intel ships virus in print utility

BY MICHAEL ALEXANDER
CW STAFF

Add Intel Corp. to the growing list of hardware and software vendors that have unwittingly shipped products infected with the Michelangelo virus.

Last week, the company said it had inadvertently shipped 839 infected copies of its LANSpool 3.01 printer server utility on 5¼-in. disks.

The only units of LANSpool affected were the versions for Novell, Inc.'s NetWare 2.1, 2.2 and 3.1, Intel said. Intel has been shipping this version of LANSpool since the last week in January.

The company said it believes an employee unwittingly infected a master disk used to make duplicates of LANSpool.

The antivirus software used at Intel's duplicating center did not detect the virus, an Intel spokeswoman said.

Customers who have received infected copies of LANSpool can obtain a free copy of Intel's own antivirus protection package, LANProtect, by calling (800) 228-4561.

Ironically, LANProtect was in beta testing when the Michelangelo infection occurred [CW, Feb. 24]. The company discovered the virus only after replacing the antivirus software package then being used with LANProtect, the spokeswoman said. LANProtect was shipped for the first time last week.

In recent weeks, several vendors of hardware and software products have shipped to customers and resellers disks that were infected with the Michelangelo virus. The companies include Symbol Technologies Corp., Da Vinci Systems Corp., Leading Edge Products, Inc. and Virtual Reality Labs.

Little havoc wreaked by Michelangelo strain

CONTINUED FROM PAGE 1

McAfee Associates in Santa Clara, Calif. There were dozens of reports of damage to data stored in IBM and compatible PCs in other countries.

At the start of Friday's business day on the West Coast, about 50 reports of damage had already arrived from the Netherlands, Belgium, Germany, Austria, New Zealand, Australia, Japan, Egypt, Brazil, Mexico and Argentina, McAfee said.

The virus struck primarily at a wide range of small businesses and did not appear to have infected more than a handful of machines at each site, he said.

"This is the first virus to do any real damage; how much we'll have to wait and see," he said.

BancOne Corp. in Cleveland had a "few" instances where portable computers or employees' home PCs were hit, according to a bank spokesman. Because the company took preventive measures, none of the machines in any bank network were stricken.

Why widespread?

There is no clear explanation why this particular virus spread so rapidly and widely in such a brief period of time, virus experts said. The Michelangelo virus was discovered about a year ago, but there were no reports of infections before September. In that month, there were 10,000 instances of the virus' appearance, McAfee claimed

The virus apparently hit in a big way in South Africa, according to one news report. A virus hot line in Johannesburg received calls from some 300 pharmacists who found their computers were inoperable because of the virus.

There were only a few reports of damage in Germany, and they mainly involved small companies, said Wolf Dieter Jahn, a virus researcher at the Virus Test Center at the University of Hamburg in Germany. "The infection rate was supposed to be 5% of all infected computers, which means approximately 10,000 PCs. That is not true for the moment," he said. Researchers from Australia visiting the Virus Test Center reported "a lot of accidents" there, Jahn said.

Greatly exaggerated

Some virus experts said the danger of the Michelangelo virus has been dramatically overblown. "The major damage was done by whoever said that 5 million computers were infected," noted Alan Solomon, chief executive of S&S Enterprises, an antivirus software publisher based in London. "The truth is so different than this piece of nonsense. We've received eight calls today from people whose computers have gone down with the Michelangelo. That is a far cry from the kind of figures we have been hearing."

The virus was detected and eradicated at dozens of computer installations in the U.S. as diverse as the U.S. House of Representatives, Sandia National Laboratories in New Mexico and the University of Utah in Salt Lake City.

"We have found several — probably 10 — cases [of the] Michelangelo viruses on our equipment, and that is just stuff reported to us," said Hal Tipton, security manager at Rockwell International and a senior director at the Information Systems Security Association.

The company has experienced "600 to 700 viral cases in the past three to four years . . . but a lot of people have to be bitten before using antivirus software," Tipton said. "I suspect that people will lose some hard disks [on March 6]; things are going to happen. What worries me is that we have identified already 10 or so computers, so I suspect there will be more."

Small percentage

Last week, Dataquest, Inc., a market research firm in San Jose, Calif., released a study in which 7% of 300 companies surveyed reported uncovering the Michelangelo virus in the fourth quarter of 1991, and 15% reported discovering the virus by January 1992.

A second study, also released last week, by USA Research, Inc. in Portland, Ore., projected that the Michelangelo virus accounted for 1.5 infected PCs per 1,000 in business organizations in 1991.

"Right now, 23% to 24% of all infections are Michelangelo," said Mark Beckham, president of USA Research. Based on a survey of 5,000 computer installations, he said, the Michelangelo virus has infected 64,390 PCs in the U.S.

Several companies such as Xtree Corp., for example, worked around the clock to meet demand for viral antidotes. Symantec Corp. claimed it had shipped 250,000 free copies of its Michelangelo edition of Norton Antivirus.

In a sense, PC users cannot win, even if they avoid being hit with the Michelangelo virus. It can be costly and time-consuming to check every PC for the presence of the virus.

"My estimate is that if a company with 800 users does its virus prevention by the book, it will cost them $1 million a year," said Dick Lefkon, an information technologies professor at New York University.

"By the book" includes updating antivirus software once a quarter, doing backups once a week and using a virus scanner every time a PC is booted.

Senior writer Sally Cusack and senior editor Joanie M. Wexler also contributed to this report.

An open letter to dBASE users

From Philippe Kahn, Chairman of Borland

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VS users seek open path

CONTINUED FROM PAGE 1

The majority of some two dozen VS users, including two user group leaders contacted recently by *Computerworld*, expressed concern about Wang's financial stability and its ability to make it as a services provider. Moreover, the IBM pact sent some VS users into a tizzy that is still going strong (see story below). Many of these users said they were leaving VS for Unix platforms.

Dennis Barnes is leading Network Management, Inc. (NMI), a third-party insurance administrator, through the final stages of a VS-to-Hewlett-Packard Co. Unix migration. The switch will cost NMI more than a VS upgrade would have, "but we're investing in our future, which we wouldn't be doing if we held on to Wang," Barnes said.

Independence a must

NMI management said it saw a "bleak" financial future for Wang, which spurred the migration. Moving to IBM was nixed in part because HP was less expensive, and "the prospect of dealing with IBM was a real downer — they're known for trying to control their customers too much, and we're very independent," Barnes said.

American Family Mutual Insurance Co. — reportedly the largest commercial VS installation in the world — is now weighing proposals from a dozen Unix vendors. The Madison, Wis.-based insurer decided in mid-1991 to ditch more than 1,900 low-end VS machines, worth more than $20 million, and move its custom, 2,000-user policy management system to an open systems-based platform, said John Trier, senior development analyst and leader of the Unix conversion project.

While American Family is satisfied with VS performance, "We have a big exposure when Wang has financial problems; we had to look ahead," Trier said. The firm is weighing buying RISC System/6000s from Wang, but "our management might look to IBM instead, just because of Wang's financial situation," said Rudy Wanless, supervisor of distributed systems.

"It's hard to turn yourself around when people are afraid to buy from you," Wanless added.

Other users are wary of Wang's sudden enthusiasm for IBM products after years of bad-mouthing IBM offerings. Wang's deal with its old nemesis startled the industry and sparked talk that Wang was abandoning the VS line. In exchange for $25 million up front and up to $75 million more within three years, Wang agreed to start selling IBM's proprietary Application System/400 immediately to the VS installed base, estimated at 19,000 U.S. sites.

"We can wait for now, but not forever."

Hugh Naughton
IS director
Gas Research Institute

Only one of those interviewed has migrated to IBM's AS/400, and his brethren are not necessarily flocking to IBM's RS/6000, as both IBM and Wang would like.

"People are mad. They don't know what's happening with the IBM deal, and [they] certainly don't see how it benefits them," said Todd Nissen, manager of migration services at Computer Remarketing Corporation International, an unauthorized Wang reseller in Beachwood, Ohio.

Confused or not, VS shops at some point will have a decision to make, users and analysts agree: Either stick with proprietary hardware (VS or AS/400) or move to a more open setup (Unix or local-area networks).

Both Unix and LANs are on the horizon for the city of San Jose, Calif., which plans to replace 20 Wang machines ranging from a VS 5 to a top-end VS 10000, according to Henry Creal, information systems analyst. An upgrade to the VS 10000 model, which Wang promised by the end of this month, is out of the question, he said.

"We can't wait around for Wang. Our VS 10000 has been overloaded since the day we brought it in," Creal explained.

The city is talking Unix with IBM and is two years into a plan to move its entire 1,000-user word processing setup to several Unix- and personal computer-based LANs. Although Wang said it would market RS/6000s and Personal System/2s under its own name sometime in in mid-1992, Creal said Wang is not an option for the RS/6000s because it probably cannot provide high-caliber service and technical expertise for the new platform.

The service issue pops up a lot. On the one hand, Wang is neither supporting AS/400s nor migrating its software to that platform. Also, Wang has promised to port key software — imaging, office automation and Pace, a relational database/application development environment — to the RS/6000. But those products have not yet materialized, although some are expected this year.

What will happen to VS?

Beyond the IBM migration issues is the more fundamental question of the future of VS systems if Wang is bent on selling IBM systems.

Miller urges users to keep the faith. In an interview last month, he pledged a 1992 rollout of 37 new VS-related products, which he called "the most extensive upgrade to the line we've ever had." Wang declined further comment last week.

Besides peripherals, a board-level upgrade to the VS 10000 is due out by the end of this month, with an actual VS 12000 machine, code-named Mercury, to follow later this year, Miller said.

Wang's "buy IBM" message is convoluted by its simultaneous "stick with Wang" song. The VS is Wang's primary source of income and is part of the Office/2000 scheme. Office/2000 is a blueprint for integrating document management and imaging technology into the office using the VS (or later, the RS/6000) as a server.

The plan also includes systems integration services, which is a tack other traditional minicomputer vendors are taking.

Some users are not entirely convinced. "I don't think [Wang equipment] is dead, but we don't anticipate buying any more," said Chuck Rush, systems project manager at McDonald's Corp. in Oakbrook, Ill.

"We're in maintenance mode while we migrate to LANs," Rush said.

Spreading their wings

Even VS users who said they are happy with Wang are looking for escape hatches.

Gas Research Institute, a Chicago-based research and development firm for the fuel industry, is actively "exploring alternatives" to its four VS minicomputers, according to Hugh Naughton, director of IS.

The company — a 10-year VS shop — runs a 300-user integrated financial and administrative system built with Pace, Wang's database and application development environment. "The system works fine as is, but when we grow, we'll probably start moving off VS to hedge our bets," Naughton said. He said he predicted a move to Unix, though he is still deciding between Wang's relabeled IBM RS/6000 and systems offered by Sun Microsystems, Inc. and HP.

A cooperative setup based on Unix or PC LANs is a better route than the AS/400, Naughton said. "I have yet to see an AS/400 that can do the job of a VS," he said.

Naughton, like other VS users, said the AS/400 is less efficient and more expensive than Wang's proprietary line. If the firm adopted the AS/400, it would lose much of its software because Wang does not plan to port existing applications to that IBM platform.

The AS/400 has other limitations for Gas Research. "We don't want to be locked into any proprietary hardware again," Naughton explained. The company has not yet decided whether to keep any of its VS boxes — ranging from a low-end VS 85 to a high-end VS 7310 — to act as servers.

IBM's RS/6000 is in the picture, but Wang may not be. Naughton said he has seen and liked presentations from third-party migration specialists and said he sees "no compelling reason" to buy RS/6000s from Wang.

However, Gas Research's "considerable investment" in VS software will keep the company tied to VS hardware for at least the next several months, he said.

"We can wait for now, but not forever," Naughton added.

KIM S. NASH

Users won't move to AS/400

By many accounts, the most tangible part of the agreement executed nine months ago between Wang and IBM was Wang's intent to convert VS users to IBM's proprietary AS/400 line. But that is the one platform some two dozen randomly surveyed Wang users said they will not embrace.

The question for some of these users boils down to how Wang can tout IBM's midrange line as a viable VS alternative when Wang sales representatives blasted the AS/400 as inferior just a year ago.

Users cited several factors that they say make Wang's AS/400 push appear halfhearted: Wang will not service the AS/400s it sells, Wang will not port VS packages to AS/400, they said, and the AS/400 is widely viewed as being slower and more costly than the VS platform.

"How can would-be converters leap from VS to IBM hardware — either AS/400 or RS/6000 — if applications don't exist?" users said in recent interviews.

In June, IBM and Wang promised to set up conversion centers around the U.S., staffed with engineers from each firm to help clients vacate the VS. Today, one central facility in Lowell, Mass., is open, abetted by a sprinkling of smaller offices nationwide.

"It doesn't make sense for us to buy an AS/400," said Bob Lucas, assistant vice president of IS at ITT Hartford, an insurance carrier in Hartford, Conn. The company will wait for Wang to port imaging software to the RS/6000 before it even contemplates a move.

Ted Hutton, an officer of the Puget Sound Wang Users Group, said none of the group's 300 members has gone to the AS/400. "If they move, it's to Unix," he said.

Wang may be pushing the AS/400 to get IBM's offer of $25 million and the right to resell the RS/6000, said Hutton, systems manager for The Port of Seattle, home to 10 high-end VS boxes. Wang recommends AS/400s to a narrow slice of VS users, such as those facing urgent capacity roadblocks with VS software. The AS/400 boasts at least 9,000 available applications to the VS' 2,000.

"IBM says it's going to be more aggressive with VS-to-AS/400 conversions because they evidently haven't closed a lot of deals," said Bill Sinan, an analyst at Technology Investment Strategies in Framingham, Mass.

Wang will not divulge how many conversions it has done in the Lowell center, except to say that it is "less than 100" out of a potential U.S. installed base that Computer Intelligence/Infocorp estimates at 19,000.

KIM S. NASH

DEC 433MP

digital

Sun hires ex-Soviet scientists

Firm aims for Russians to be 100% technically autonomous

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week announced it will collaborate with a group of ex-Soviet scientists on projects led by Boris A. Babayan, the Russian counterpart to U.S. supercomputer designer Seymour Cray.

The joint projects will include work on advanced versions of the Scalable Processor Architecture (SPARC) chip and new types of compiling techniques, said Wayne Rosing, president of Sun Microsystems Laboratories, Inc.

Babayan, 59, is now completing work on the Elbrus III, a supercomputer said to rival the fastest machines from U.S. companies such as Cray Research, Inc. Hobbled for years by outdated computer hardware, the Russian programmers have developed a strong reputation for efficient and innovative software design, Sun officials said.

"People should not interpret that Sun Laboratories is going into supercomputers," Rosing stressed. "We already have relationships with Cray and Thinking Machines, who are building SPARC-based supercomputers."

Striking such a high-profile deal with the premier computer designers in Russia indicates how quickly Sun's year-old research and development organization is maturing. A few months ago, Sun also scooped up a key IBM software expert, Steve Uhlir, who was one of five Repository Manager developers at IBM's Santa Teresa, Calif., laboratory [CW, Jan. 27].

Sun supplies funds

The team of 50 Russian scientists working with Sun will remain at the Institute of Precision Mechanics and Computer Technology within the Russian Academy of Sciences. Sun will supply computer hardware and an undisclosed amount of financial support in a deal somewhat akin to a university grant, Rosing said.

"We are hoping to help them launch an indigenous ability inside Russia for them to design and build SPARC computers 100% on their own, without technical dependence on Sun or the West," Rosing said.

Sun's research and development group has an annual budget of $300 million, 100 core researchers and another 100 employees doing advanced development. "Our absolute core competencies are the SPARCstation products lines and Unix," with only about 5% of the R&D effort aimed at more abstract research projects, Rosing said. "The next wave we see, in a word, is a much more profound application of object technology."

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DEC sweetens early retirement deal

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — In an attempt to induce a voluntary work force reduction, Digital Equipment Corp. is offering approximately 7,000 employees a special early retirement program.

To sweeten the offer, DEC will help qualify employees for early retirement by adding five years to their age and number of years of service when calculating retirement benefits. Under the standard early retirement program, an employee must be 55 years of age with 10 or more years of service, or 65 years of age with one or more years of service.

The special program will be in effect for a little less than three months. During this period, all other transition efforts at DEC will be suspended, except for those programs already announced, a company spokeswoman said.

The existing transition program was introduced in September 1989 and was voluntary until 1991. DEC says 12,450 people have left the corporation under that program. A DEC spokeswoman said the company has no set downsizing goals for fiscal year 1992.

The program is open to U.S. employees and employees currently on temporary assignment outside the U.S.

DEC currently has 119,500 employees worldwide and just over 60,000 in the U.S. In July 1991, DEC announced 2,000 employees would be laid off in the first installment of an anticipated 16,000 job cut by 1993 [CW, July 29, 1991]. In late June 1991, Jack Smith, who was DEC's senior vice president of operations at the time, had confirmed that DEC might have to lay off as many as 8,000 more employees during fiscal 1992.

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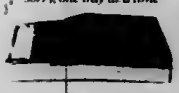

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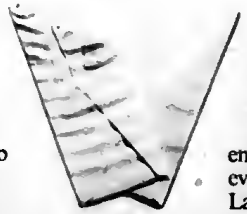

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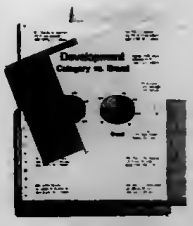

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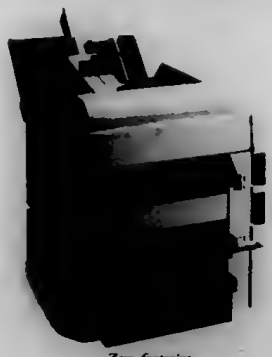

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ADVANCED TECHNOLOGY

Group finds way to speed widgets to market

Computer scientists, engineers and others team up to create system that develops widgets in half the time

BY MICHAEL ALEXANDER
CW STAFF

A team of computer scientists, mechanical engineers and other experts from five universities have pooled their diverse talents to design a desktop system that will dramatically speed manufacturing of all kinds of widgets made in machine shops.

The team's rapid development system, or RDS, has the potential to slash in half the time it takes to design and manufacture products that must be either milled or drilled from a block of metal, said John Eimermacher, professor of mechanical and aerospace engineering at the University of Dayton in Dayton, Ohio. Eventually, the RDS will be used to tackle products cut from cylinders and other shapes, he said.

The team includes researchers from Case Western Reserve University, Cornell University, the University of Cincinnati, Wright State University and the Materials Directorate at Wright-Patterson Air Force Base in Dayton. The RDS was developed for the U.S. Air Force's 4950th Test Wing at Wright-Patterson, which is now putting the system through its paces in a pilot program.

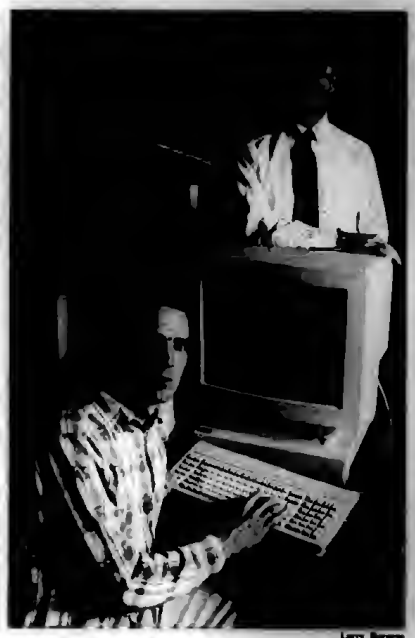
The RDS speeds manufacturing time by removing much of the uncertainty in the design and manufacture of custom-made parts, Eimermacher said.

"Within a company there are many different functional activities that go on in the product development cycle, from product design to manufacturing," he explained. "In the past it all happened in series. We looked at streamlining this overall process."

The researchers devised a system that combines elements of computer-aided design (CAD), computer-aided manufacturing (CAM), expert systems and numerical control process planning, the actual machining of parts.

The software used by the system includes Concept Modeller, a CAD package from Wisdom System, Inc. and Metcapp, a process planning program from the Institute for Advanced Manufacturing Sciences. The software runs under Unix on a Sun Microsystems, Inc. SPARCstation.

In most CAD/CAM systems, designers connect lines, circles, arcs, cylinders, blocks and other so-called "primitives" to make "product features" such as holes, pockets and slots, Eimermacher said. The RDS uses feature-based modeling techniques in which features already have been designed and stored in the program. The shape and measurements of a hole, for example, are already defined without the user having to resort to using primitives.



Larry Burgess

University of Dayton's *Dave Domeruth, left, and Eimermacher helped design the RDS*

The system also contains an expert system that draws on the knowledge of machinists and information, such as standards, contained in manuals and other sources. The expert system enables a product designer to create a part that meets both functional needs and machine shop practices without having to rely on the knowledge of a manufacturing process engineer.

Typically, a designer engineers a product without knowing whether the part can actually be fabricated — that is not known until a manufacturing process engineer takes a look at the design, often several days or weeks later. The expert system in the RDS guides the designer as the design is being created, thus saving time and perhaps costly mistakes.

"We take the design and develop a machining operations process plan — a step-by-step procedure defining the tooling, the machines to be used and the speeds and feeds to get from the raw block of metal to the final configuration," Eimermacher said. "The system automatically evaluates the design and the process simultaneously. Users may not be familiar with all of the details of manufacturing, but the system will lead them through this process."

In addition to the process plan, the other end product of the RDS is a numerical code on tape or disk, which a machining center uses to fabricate the part.

Illinois envisions network to monitor nuclear power plants

BY JIM NASH
CW STAFF

In Illinois, information systems managers, research scientists and government bureaucrats are proposing a network of supercomputers that would be used to help predict the possibility of an accident at the state's 13 nuclear power plants.

Illinois, with more reactors than any other state, has a vested interest in upgrading the existing network of automated plant monitors into a system that could actually be used to anticipate plant accidents.

Systems capable of predicting gross trends and some events exist today. The trick is to increase both the detail of predictions and the speed at which they can be made. Roy Wight, manager of nuclear facility safety at the Illinois Department of Nuclear Safety in Springfield, said efforts across the nation show that reliable predictions of various complex situations can be automated.

The question is whether these predictions can be made in real time or in what is being called "better than real time."

"Faster than real time means taking certain data and finding out what a reactor's going to do in the next hour — but finding out in the next five minutes," said Charles Catlett, manager of network development at the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign.

Supercomputers on patrol

The project would ultimately enlist linked supercomputers — or new massively parallel machines — as well as mainframes now in place to monitor events at plants, explained Chuck Mueller, associate director of computing at Argonne National Laboratory in Argonne, Ill. Mueller joined with other Argonne officials and the NCSA in pushing the idea to the federal government last July.

The two organizations outlined an initial $500,000 plan to establish a team of hardware and software experts to make an accurate assessment of the resources needed. Codes currently used to monitor nuclear plants and those capable of simulating accidents would be rewritten to run on supercomputers and massively parallel computers.

Once that has been done, it will be possible during the next decade to distribute the applications across Cray supercomputers at the University of Illinois and Argonne and the 27 Prime Computer, Inc. 9955s and 6650 mainframes spread around Commonwealth Edison's 12 plants and Chicago headquarters, proponents said.

ComEd's computers and those at Illinois Power Co.'s single nuclear plant use dedicated lines today to deliver 1,000 pieces of information about plant flow rates, temperatures, output and effluence every two minutes over dedicated lines to the state's Digital Equipment Corp. VAX 8530 and 4300.

In the short term, the National Science Foundation's NFSnet 600M bit/sec. national network would carry the information. However, greater throughput would be required to meet the "faster than real time" goal, Catlett said. It is unclear how much the project would ultimately cost. The infrastructure costs alone could run more than $100 million just counting the NFSnet.

Although the Defense Advanced Research Projects Agency passed on the group's funding appeal without comment, Catlett said confidence is high that the project will find sponsors. He said industry interest so far has been high, a good indication that the proposal is not a pipe dream.

ComEd has stated that it is interested in the proposal. A spokesman said if it seemed plausible, the corporation would probably undertake it in partnership with the Department of Nuclear Safety.

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EDITORIAL

Mouths that roar

Lately we've focused considerable attention on the various pricing schemes being mulled by some mainframe software vendors, such as IBM and Computer Associates. The changes, no matter how they are construed, ultimately point in the direction of price breaks for users.

For example, the partition-based pricing under consideration by IBM and possibly others would have users pay a fraction of the full license charge for certain packages, depending on how much computing resources the packages actually consume. Read: a price reduction.

The big system vendors are trying desperately to hold back the migration to smaller, cheaper computing platforms, because mainframe software sales and maintenance contracts are *very* lucrative.

But is there some other force or dynamic at work here? Consider some other stories and headlines we've run recently: Demanding better software quality and support, "Users give Sun an earful" (some of these users are such the ingrates); after a decade of pushing millions of boxes through third-party reseller channels, Compaq's customer support ranks grow to 100 people — up from *zero* a year ago (what will users demand next?). And Microsoft takes it on the chin from its biggest E-mail user (the audacity of some customers). These stories came from just one issue — last week's.

Before you yawn and say, "So what, customer demand drives the marketplace," allow me to posit one point: The demand-driven market is not business as usual — not in this business, anyway. It is fast becoming the norm, and it's clearly catching some vendors off guard.

For years — decades, even — mainframe sites operated within the context of an operating system monopoly run by IBM. Is it any wonder users are so carefully measuring their mainframe alternatives, thereby forcing a change in IBM's pricing strategy?

And since bursting on the scene a decade ago, desktop software vendors as well as most hardware vendors simply chose not to deal directly with users, allowing third parties to handle sales, support, complaints, etc.

Today, any company fishing for success in the corporate market must understand the IS requirement that all products integrate into a companywide computing paradigm. In other words, they have to relate to the very customer whose attentions they covet yet whom they have avoided for so long. And that customer, they are finding, is a very demanding sort.

So it is this dynamic — the scrambling to fill the need of an increasingly liberated user base — that has become the most salient factor shaping the information technology world today. It's about time the dog wagged the tail.

Bill Laberis

Bill Laberis, *Editor in Chief*

LETTERS TO THE EDITOR

Wang never lost his visionary edge

Charles Kenney, in his hatchet job on Wang Labs [CW, Feb. 17], implies that the late Dr. An Wang had lost his visionary touch toward the end of his career. That does not square with the facts.

For example, at the annual convention of Wang users in 1988, Dr. Wang proudly introduced a pen-based system called Freestyle. Today, four years later, pen-based computing is suddenly a very hot topic.

In addition, the Doctor was shrewd enough to literally "bet the farm" on Wang's imaging technology, which is still a couple of generations ahead of the competition. Just this week, two publications have crossed my desk featuring the success stories of WIIS at Met Life and the city of Phoenix, the latter of which has won four awards.

It is sad to witness the "Wang bashing" continue long after the Doctor's death.

John R. Boots Jr.
Stringer Tire Co.
Jacksonville, Fla.

Bug-free zone

As a consultant with experience in many shops, I found "Bug-free code: the competitive edge" [CW, Feb. 17] inconsistent with my experience.

You do ask a very good question: "But what can be done short of the traditional and costly process of extending the testing phase?" However, I suggest that a better question is, "Why can't we analyze the business and design the software structure right the first time?"

The quality management systems used by blue-collar factories might be effective for "software factories" also. Bug-free quality can be built into the requirements and design. As part of these early phases, the requirements and design can be tested and measured.

As a consultant, I am happy to be paid to find bugs in the code. I would be even happier to be paid to debug the design.

Robert P. Schmidt
Schaumburg, Ill.

Software pricing, licensing unrelated

Regarding your coverage of the lawsuit between Electronic Data Systems Corp. and Computer Associates International, Inc., you should be applauded for attempting to make sense of a critical issue between two of the most important vendors in the industry.

However, in my opinion, it seems that you are inadvertently combining two disparate issues: software licensing and software pricing. The issues are both important but not related.

The courts are best equipped to resolve the reasonability of business practices involving specific disputed software licensing. The marketplace is best equipped to resolve the issue of equitable software pricing.

George Emmanuel
Chairman
Information User Association
Chicago

A security danger

Thomas A. Guidoboni [Viewpoint, CW, Feb. 17] brought up a disturbing possibility concerning forfeiture. If the Justice Department were to gain the ability to use forfeiture laws in cases of suspected computer crime, this could have serious side effects that might outweigh gains in computer security.

Forfeiture is not a tactic used to seize property after guilt is proved, but a tactic where assets can be seized before guilt is proven. Even if the government cannot prove guilt, assets do not have to be returned by law enforcement agencies unless the suspect can prove again in civil court that be is innocent. It is much more difficult to show innocence in a civil case then in a criminal one.

Forfeiture is a gross abuse of law enforcement powers, because it allows the government to punish individuals or businesses if they are accused of a crime, and this can make false accusation a very effective tool of revenge or harassment for disgruntled employees and competitors.

Bradley D. Falk
President
Luna Software Development, Inc.
Los Angeles

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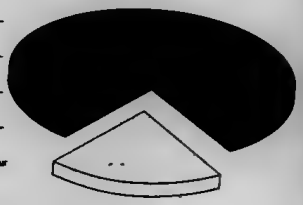

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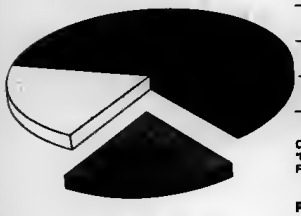

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Fed up with bad directions

NANCY S. MUELLER

The press focuses a lot of attention on bugs that show up in microcomputer software releases. A parallel, but less discussed problem, is the bugs that infest hardware and software manuals and instruction sheets.

Although the press hasn't pounced on these bugs as severely as it has on software bugs, they can cause just as much havoc.

Working with third-party hardware and software for IBM compatibles and Apple Macintoshes, I've compiled a list of bugs from poor-quality user manuals. There are, for example, the invisible bugs (missing instructions), the disguised bugs (unclear or cryptic instructions), the tricky bugs (out-of-sequence instructions) and the fake-out bugs (incorrect instructions).

Some of the problems I've encountered as a result of such bugs will probably sound familiar to others. A few of the recent include the following:

Nicolas Asem

- **What's wrong with my keyboard?** An unusual multikey press/release combination required to perform a program function on a Macintosh was unexplained in the documentation. What I assumed the picture of the three keys meant didn't work, and it was only after reinstalling the software that I accidentally discovered the correct key combination.
- **Where's the jumper?** The instructions for an IBM-compatible graphics adapter card indicated that a certain jumper setting should be changed, depending on the monitor being used. But there was no such jumper on the card.
- **What happened to my D drive?** The readme file for a hard disk I was installing stated that if I was using a disk manager to partition my original hard disk, my logical D drive would become E because the first DOS partition on the new drive would become D. In reality, my D drive became H. No mention was made of the fact that I might have to modify my autoexec.bat and win.ini files or even have to reinstall some software.
- **When should I reboot?** The instructions for a resident program I was installing on a Macintosh told me to place the program in the system folder and then go to the control panel and make the desired changes in the program's control device. The last instruction was to restart the Macintosh. In reality, it had to be restarted before going to the control panel.

Although the need for good user manuals isn't new, it's increasing in importance for a number of reasons. Operating environments are becoming more sophisticated. Software programs are becoming more complex. More users are working on multiple platforms. And there's a growing number of inexperienced users installing and using hardware and software.

All of these factors increase the negative impact of poor documentation, but probably the most critical is the rising population of inexperienced users. As one of my colleagues recently observed, "For experienced users, poor manuals are more of an annoyance and a time-waster than anything else; but for inexperienced users, poor manuals can be paralyzing."

So why are poor-quality manuals getting packaged with products? Is it that the vendors don't realize the negative impact of their actions, or that they actually don't know their manuals are second-rate? Perhaps it's time for some quality checks.

Mueller is an MIS technical adviser to the Graduate College at Bowling Green State University in Bowling Green, Ohio.

Forget industrial policy: Give us public data transport

GEORGE A. KEYWORTH II

It is ironic that as our economic challenges have grown over the past decade, this nation has progressively drained any real meaning from the phrases "industrial competitiveness" and "industrial policy."

We have engaged in tiresome arguments about what kind of responsibility government has for preserving each waning remnant of the industrial economy. We've also overinvested our public efforts in a handful of politically safe government initiatives such as the formulation of industrial consortia, revising patent regulations and passing less restrictive antitrust policies.

Such half-hearted, incompletely considered programs, even if wildly successful, could hardly do more than nibble around the edges of the problem of international competitiveness. In my experience in government, I have seen a disheartening succession of commissions and blue-ribbon panels convened over a decade — an effort that produced almost nothing of consequence and distracted attention from potentially more fruitful approaches.

Faster feedback

What makes an industry or a firm competitive? Mainly it's the ability to serve customers better than the other guy can.

Throughout most of this century, the U.S. economy has had an edge in customer service because our market is so well-attuned to interaction with customers. We've always had quick feedback from an immense domestic market, and that pool of information — rather than abundant natural resources or labor, which other countries have as well — was what differentiated the U.S. economy from most others.

Lately, however, other nations have been increasingly efficient at incorporating market feedback into their own systems, and they have linked that feedback with increasingly short feedback loops in the development and production of products and services.

I'm convinced that the best way to identify a national-level means of dealing with our future competitiveness is to discard our penchant for consortia and antitrust policies and focus on providing the information infrastructure with which the future battles will be won.

We all know that Japan is aggressively revamping its communication infrastructure not only to make it broadband but also to include a large number of nodes; that is, to create a public network in which connectivity is very important. What may be less well known, however, is how much economic impact Japanese experts expect from such a broadband public network. They expect something like 30% of the Japanese gross national product in the year 2015 to be derived from new goods and services made possible by their public fiber-optic network.

We should not hold that number up to much scrutiny, however, because its accuracy is neither important nor ascertainable. What is important is the order of magnitude that thoughtful people are attributing to this infrastructural change — and the way in which a nation is responding to its perception of where the economic future lies.

If we view Japan as our toughest competitor, we must think harder about how we're going to compete.

We have already taken the first step. In its role as a supporter of research, the federal government has stimulated the development of high-bandwidth networks to serve the relatively small, but very demanding, research community.

But there are more than 60 million other computer users out there. These are the people for whom the digital infrastructure must be built. Just as in Japan, connectivity — getting vast numbers of people onto the digital network — must become a priority.

This means more than having a data highway: It means data boulevards, avenues, streets, alleys and airwaves. Moreover, whatever efforts we undertake now to get things moving must take into account the future need for broadband connectivity for the tens of millions. We need to be able to include them without having to revamp the system yet again, when it will probably be too late.

Keyworth is a Distinguished Fellow at the Hudson Institute in Indianapolis. He served as science adviser to President Reagan from 1981 to 1985. This article is adapted from a Hudson briefing paper.

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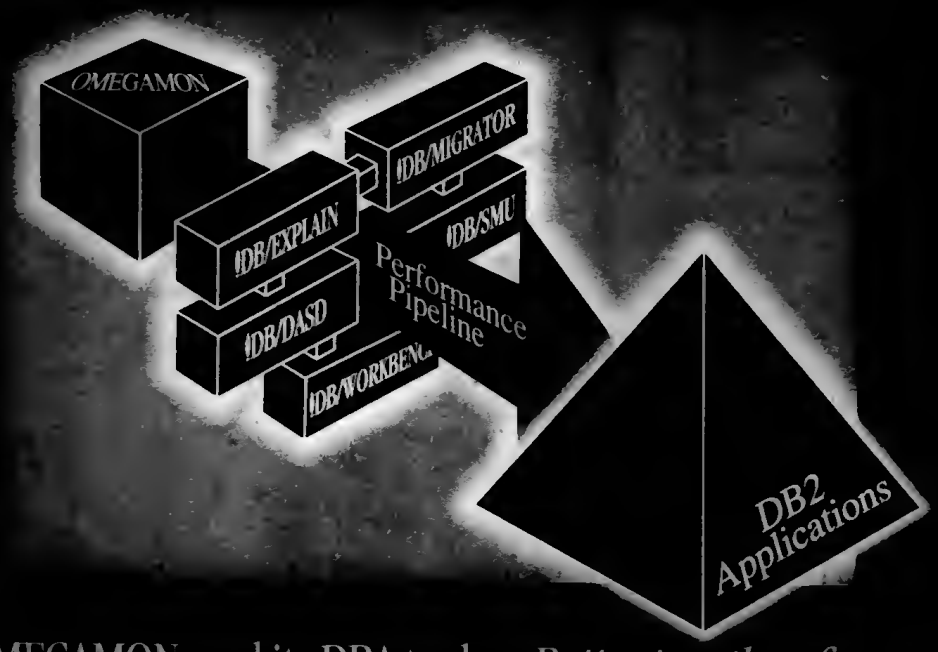

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COMMENTARY

Rosemary Hamilton

Sea change in Boca

IBM recently tried something different in its campaign to promote OS/2 2.0. It opened up its OS/2 development facility in Boca Raton, Fla., to the press.

This may not seem like a big deal, but it is certainly unusual for IBM. It should be noted that this is simply a public relations move. But it is still a good one.

At Boca Raton a few weeks ago, a group of technicians sat around a table and talked about their work. They also commented frankly on the changes IBM made to develop OS/2.

Something all their own

What was once a rigid atmosphere is now far more casual, they said. More importantly, small teams of developers are given ownership of OS/2 components.

It was obvious that these guys weren't crazy about the days when Microsoft and IBM were codeveloping the operating system. The partnership only added to the bureaucracy, they said. What's more, it was a "politically hot situation" where "each company had its own agenda," one developer said.

Continued on page 40

Stumped? Ask your Mac

At Colgate-Palmolive, software gives computers a mind of their own

BY JAMES DALY
CW STAFF

NEW YORK — When was the last time your personal computer actually thought for you? How about an easier one: Has your PC ever plucked a useful piece of information out of an obscure source you never dreamed of tapping into? Don't all answer at once.

In one lucky division at Colgate-Palmolive Co., however, this is getting to be a common occurrence, with a network of Apple Computer, Inc. Macintoshes.

"Too often in the past, we've been limited by the way a system has been designed, and we needed to change that," said Frank Morelli, director of the company's customer support, marketing and management systems. "Our managers knew what they wanted, but they didn't know where it resided or even how to access it."

Morelli's solution was Muse, an innovative data-analysis application from Watertown, Mass.-based Occam Research Corp. that has become a key part of the way Colgate-Palmolive maps its global business strategy. Muse links an internal database engine with a data dictionary and natural-language querying capabilities to let Morelli's marketing managers pull in data from a wide variety of sources — even those they never considered accessing.

These managers are continually working to spot trends and pinpoint opportunities for growth, employing Muse to interactively analyze financial and market data about hundreds of consumer products sold by Colgate in about 160 countries.

Putting away the shovels

Muse combines the power of a relational database with seamlessly integrated analytical tools, allowing its users to easily gather and graph the data for instant ad-hoc analysis. "I can see trends in just a few minutes now — I don't have to dig for them," Morelli said.

In the past, category marketing managers had to hack through thousands of Microsoft Corp. Excel spreadsheets in order to pull up disparate sales data. "While all the information was there, it often was delivered across many different spreadsheets that they would need to cut and paste and consolidate," said Lynne Tapper, a senior consultant.

Because there was so much information, it could sometimes take analysts hours to find what they were looking for. "We had a lot of market information available, but it was sometimes difficult to make sense of it," Morelli said.

Muse's first advantage was simple yet very important — it could understand commands in plain English. If you wanted to know how many tubes of toothpaste were sold in France in the first quarter, that is exactly what you would ask it. "You ask what you'd like to know as if you were talking to someone standing beside you," Morelli said.

Users can then even animate the data to produce a time-line chart.

Morelli said that in order to build natural-language queries, both the data and the query must be created separately. These queries are then saved, reused and shared on a server.

Muse's powerful relational data manager imports data in a variety of formats, from simple text to mainframe SQL databases. The data used in Muse is electronically collected from global subsidiaries and placed on an IBM mainframe running MVS

Continued on page 40

Colgate-Palmolive managers' Muse *is a tool that brings market data to their fingertips*

ON SITE

Colgate-Palmolive Co.
New York, N.Y.

- **Challenge:** Interactively analyze financial and market data about hundreds of consumer products. Reduce time required to study data while more efficiently spotting trends and opportunities.
- **Technology:** Occam Research Corp.'s Muse, an executive information and data analysis tool running over a network of Apple Computer, Inc. Macintosh computers.
- **Benefits:** Reduced data analysis time while letting users gain a new understanding of information's interrelationship.

If you catch a virus, see your attorney

BY MICHAEL ALEXANDER
CW STAFF

In the wake of several reported instances of vendors distributing personal computers and software infected with viruses, users who have had their data scrambled and suffered physical or economic harm as a result should not hesitate to tell it to a judge, according to legal experts.

Although no cases in which a user has sued a vendor for damage caused by a so-called shrink-wrapped virus have yet made it to court, users do have legal recourse, said Lee Gesmer, a partner at Lucash, Gesmer & Updegrove, a Boston law firm specializing in computer law.

"If someone plants a defect — a virus — in the control system of a jet airplane, for example, where there was a catastrophe that caused physical injury to someone, everyone in the stream of commerce, from the maker of the software . . . to the value-added reseller, would be strictly liable," Gesmer said.

The issue of economic injury is more complicated because of the shrink-wrapped license or disclaimer commonly affixed to commercial software packages. It is still uncertain what protection the shrink-wrapped license affords a vendor.

However, in the case where a user is not given an opportunity to read the disclaimer before purchasing a product, which often happens when buying by mail order, for example, "the publisher of the software could easily be facing a major lawsuit for economic injuries resulting from the virus that was inadvertently transmitted," Gesmer said.

Several companies have shipped hardware and software infected with computer viruses to end users and resellers. In the last weeks of 1991, Novell, Inc. was forced to send letters to 3,800 customers warning that the December release of its network support encyclopedia had been infected with the Stoned III virus.

At about the same time, resellers received 500 computers from Leading Edge Products, Inc. with hard disks infected by the Michelangelo virus. Last month, Da Vinci Systems Corp. mailed 900 infected demonstration disks to customers and resellers. Last week, Intel Corp. warned that a virus had infected one of its print server utilities.

Something's going around

"I have now encountered three viruses in the past year, and every one of them has been associated with legitimate distribution," said David Kahn, a consultant at D. Laughton Associates, a value-added reseller based in Natick, Mass. He received one of the infected disks from Da Vinci, he said.

Kahn said Da Vinci did not notify him that the disk was infected, and he learned about the problem only after reading about it in *Computerworld* [CW, Feb. 24], he said.

"Not only do they have a moral obligation to tell people about it, they have a liability," Kahn said. "That is one of the reasons that I go through the procedures that I follow to avoid pollinating viruses across my clients."

Da Vinci took considerable care to notify everyone who received the infected disks, said Chris Evans, vice president of marketing at Da Vinci. The company distributed an alert by electronic mail and posted a free antivirus software program on its bulletin board, among other measures.

The rapid proliferation of incidents involving vendors is changing the computer community as well as the legal landscape, said Mark Gordon, partner at Gordon & Glickson, a Chicago law firm specializing in computer law.

Vendors will find themselves more obliged to check for viruses at every stage of distribution or risk lawsuits, Gordon said.

At the same time, users may not have legal recourse when they have failed to use up-to-date antivirus software or back up their data, Gordon noted.

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Stumped? Ask your Mac

CONTINUED FROM PAGE 37

in the New York office. The marketing personnel access Muse-related information through a series of Apple Computer, Inc. Macintoshes running over a 3Com Corp. twisted-pair network.

The data is organized in Databooks containing multiple tables of data. The Databooks are joined automatically so that many of them can be referenced at once. If a marketing manager asks for sales in a given region during the past three years and notices that they are rising, he may want further information and may need to know who the major contributors are — or which countries in the region were losers. That is when the interactive linking of Muse data kicks in.

With these answers in mind, the manager can explore further. Particularly helpful are the "what-if" reporting features. "It's something you can't do with a traditional spreadsheet-type system because those are really limited by access techniques," Morelli said.

To the user, the whole appearance is a single large pool of data that can be accessed and analyzed on the fly. Add to that the knockout punch of being able to pull up information lurking in the background that the user never considered.

"We're finding information and relationships that we never really thought of going after," Morelli said. "You can't ask for more help than that."

Hamilton

CONTINUED FROM PAGE 37

In that environment, developers worked as part of a large team. They didn't necessarily know what would happen to their chunk of code once they completed their work. They didn't know what the person in the next office or down the hall was working on, much less how it fit in with their work.

It doesn't take a rocket scientist to figure out that this kind of atmosphere doesn't exactly motivate employees.

After the changes, developers were given a chance to own their work. It may be just a small piece of code, but they see it as part of OS/2 2.0 and can say it's theirs. There's plenty to be said for this kind of ownership and how it can motivate someone. Your personal success or failure is reflected in the product, and that's far different from being just one of many anonymous developers.

IBM's willingness to provide access to this group is a good sign. Contact with the real people, not the marketing reps or the managers, helps us get more information to you, the reader.

I've had the opportunity to attend dozens of IBM briefings. I've had my share of formal lunches, and I've seen countless slide shows and slick media productions. There was nothing polished about this visit with the developers. But it shed more light on IBM's OS/2 effort than any other briefing I can recall.

Hamilton is a *Computerworld* senior editor, personal computing.

IN BRIEF

Microsoft adds help

■ **Microsoft Corp.** has announced that a Developer Services Area will be available to CompuServe users.

The system is intended to give developers quicker access to technical support and information than was available through previous means.

Five forums will be available, including Windows Software Development Kits, Windows 32-bit application programming interfaces and a developer-specific Microsoft Knowledge Base.

A private support area will be available for more complex problems.

■ **Wyse Technology, Inc.** in San Jose, Calif., will offer users of its Decisionmate notebook computer a new service option.

Under its Notebook Express plan, Wyse will take notebooks in need of repair, pay for express delivery service to a Wyse service center and return the notebooks within 48 hours.

■ **Phoenix Technologies Ltd.** in Norwood, Mass., recently announced an agreement with INMOS, a unit of SGS-Thomson Microelectronics Group, to develop video basic I/O system products for IBM's Extended Graphics Array (XGA) video controller.

The drivers are expected to comply with the Video Electronics Standards Association (VESA) standard for XGA.

"What that means for users is there will be a common way for their apps to access XGA and initialize them," said Jake Richter, president of Panacea, Inc., a Londonderry, N.H.-based maker of graphics software accelerators.

"If you look right now at the super VGA, prior to a VESA extension, each BIOS had to be initialized for the card," creating incompatibilities, be said.

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Model	Entry Grayscale Workstation**	Entry 8-bit Color Workstation†
IBM 220W	$7,185	$9,995
HP 705/710	$8,415	$14,065

Scientists see stars. CASE users can start with a grayscale workstation with a paging disk for just $7,185. If it's CAD clout you're after, you can get a workstation specially outfitted for mechanical design—with 2D color graphics and 400MB of fixed disk storage—for only $9,995. All models in the POWERstation 220 series come with two expansion

*In Canada, call 1 800 465-1234. **16MB, Paging Disk, Display, Operating System, Graphical User Interface. †16MB, 400MB Disk, Display, Operating System, Graphical User Interface. IBM is a registered trademark and RISC System/6000 is a trademark of International Business Machines Corporation. SPECmark is a geometric mean of the ten SPECmark tests and is a trademark of Standard Performance Evaluation Corporation. All SPECmark figures listed are as published by their respective manufacturers. All prices listed are MSRP. Remarketer prices may vary. IPC is a trademark of Sun Microsystems, Inc. DEC5000 is a trademark of Digital Equipment Corporation. UNIX is a registered trademark of UNIX Systems Laboratories. HAGAR THE HORRIBLE Character(s) © 1992 King Features Syndicate, Inc. ©1992 IBM Corp.

This advertisement created by

Taylor Medical overcomes gridlock

BY CAROL HILDEBRAND
CW STAFF

BEAUMONT, Texas — Chief Information Officer Jim Hayes said he knew something had to be done about Taylor Medical, Inc.'s elderly computer system when he had to tell one of the women in the cash applications department to bring her embroidery to work.

The response time of the system was so terrible that Taylor's employees were getting totally frustrated. "I said, 'Don't work yourself into the doctor's office,'" Hayes said. "Bring in your needlepoint."

Hayes' response to the systems gridlock was to switch from a System/36-based configuration to a local-area network based on two SystemPro file servers and six 33-MHz Intel Corp. 1486-based DeskPros from Compaq Computer Corp. The LAN runs Santa Ana, Calif.-based California Software Products, Inc.'s Baby/4XX and Coral Springs, Fla.-based Citrix Systems, Inc.'s Multiuser.

Taylor Medical, a health-care equipment supplier based here, is in the enviable position of getting too big for its britches. Serving some 16,000 accounts nationwide, the company sells everything from tongue depressors to medical office equipment.

Founded in 1987, the firm has grown to about $100 million in sales in 1991. Its rapid growth has left the company behind the power curve from its inception, Hayes noted. Taylor Medical had started with "a little baby System/36" and had worked its way up to six 36s — three at the Beaumont corporate headquarters and three scattered across its distribution centers nationwide, he said. More than 150 employees used the system for such standard business applications as order entry, inventory control and accounts receivable.

ON SITE

Taylor Medical, Inc.
Beaumont, Texas

Hayes said that he had originally thought of adding another System/36 to his environment but realized that speed and disk capacity requirements would remain unfulfilled. Switching to the newer IBM Application System/400 was nixed because Hayes did not want to lock himself into another proprietary environment. While its hardware was completely outmoded, the company had recently upgraded all of its software to RPG III — a minicomputer language — and did not want to waste that investment. That's where Baby/4XX came in, Hayes said.

Baby/4XX provides the compiler and operating environment of RPG III while allowing Taylor Medical to run its System/36 applications on a personal computer network. When the firm tested an accounts receivable program that usually clocked in with an eight-hour preparation time on the System/36, Hayes said, it took about 30 minutes on the new system. He now uses the two SystemPros to run Novell, Inc.'s NetWare.

Unraveling entanglements

The next snag was addressing the fact that the Baby/4XX compiler had to run under OS/2. The thought of putting a PC on every desktop filled Hayes' budget with dismay, not to mention the fact that most of his staff was not PC literate. For Taylor Medical, using Citrix's Multiuser — a multiuser version of OS/2 — meant that the company could support 30 or 40 employees on terminals from each of its six DeskPros, a considerable cost-cutting measure.

Hayes said he now supports 200 users on 35 nodes and is able to keep a centralized data processing environment by housing the DeskPros in an easy-to-access spot. However, simplified repetitive applications, such as order entry, do not a power PC user make, and Hayes said he recognizes that his present setup lets him mask the basic architecture switch from the end user.

According to Hayes, Taylor Medical's employees at present do not know the most basic functions of how to use a PC or maintain it. "If I had 200 PCs out there right now, I'd be in trouble given my users," he said. Hayes added that where there is a power user in need of an actual PC, it is easy enough to put one out there. In fact, he said the open-endedness of the system — the ability to add nodes as needed — leaves him plenty of room for growth.

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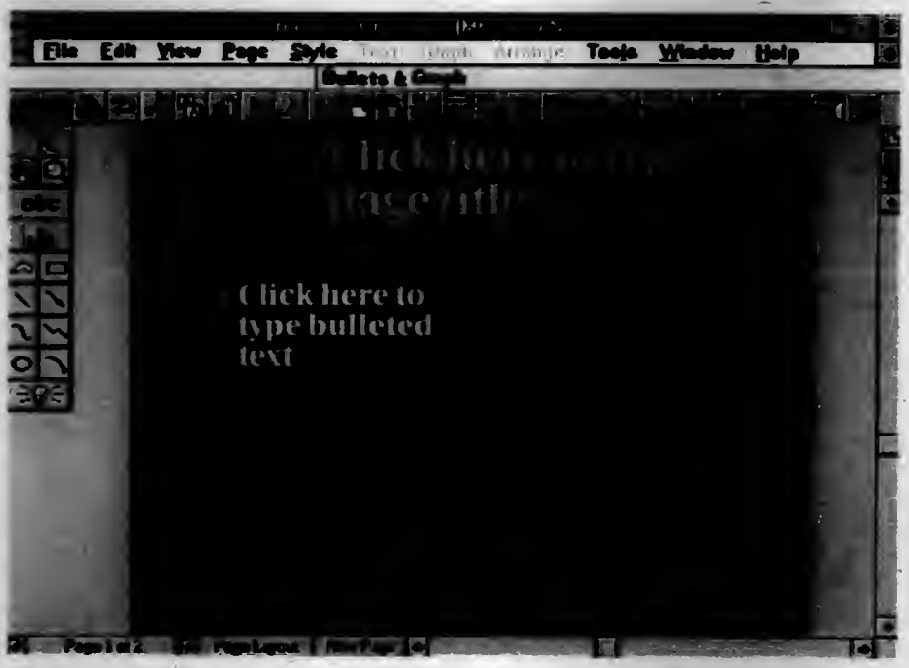

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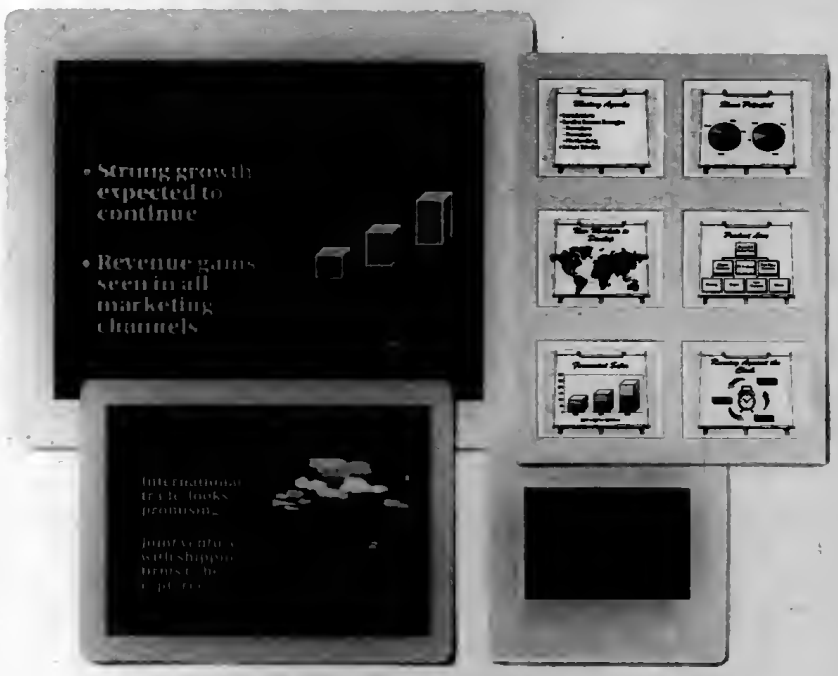

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NEW PRODUCTS

Database management systems

Recital Corp. has ported its Recital database application development software to the Sun Microsystems, Inc. workstation platform.

Recital Version 7.1 supports Recital/4GL executable programs executing from shared global memory, allowing users in distributed environments to handle larger applications. It offers more than 60 additional enhancements to its fourth-generation language and other development tools, the company said.

Unix pricing starts at $995 for a single-user developer's edition. An edition with the compiler included costs $1,295. The product is also available on Digital Equipment Corp. VAX/VMS systems.

Recital
85 Constitution Lane
Danvers, Mass. 01923
(508) 750-1066

Software utilities

Micro 2000, Inc. has enhanced its MicroScope diagnostic software for personal computers.

Version 4.28 performs more than 100 diagnostic tests for processors, disk drives, video and other system elements. The software includes batch control and expanded on-line help for all tests and automatic mapping of bad sectors. It also finds I/O and node addresses for network cards.

The product costs $449.

Micro 2000
3rd Floor
1100 E. Broadway
Glendale, Calif. 91205
(818) 547-0125

Polaris Software has developed a collection of Dynamic Link Libraries connecting its PackRat information manager with other Microsoft Corp. Windows applications.

The PackRat Integration Library 1.0 allows users of Microsoft, WordPerfect Corp. and Lotus Development Corp. word processors to access PackRat information without exiting the word processing program.

The software costs $29.95.

Polaris Software
Suite 307
17150 Via Del Campo
San Diego, Calif. 92127
(619) 674-6500

Mastersoft, Inc. has started shipping Version 5.0 of Word for Word Professional, its conversion utility for Microsoft Corp.'s Word for Windows.

The upgraded file format conversion software supports additional file types including Lotus Development Corp.'s Ami Pro 2.0 and other word processors.

The utility costs $79.95. Upgrades are $39.95.

Mastersoft
Suite A-320
6991 E. Camelback Road
Scottsdale, Ariz. 85251
(602) 277-0900

Pkware, Inc. has introduced Pkzip 2.0.

The new version of the data compression utility runs in 183K bytes of conventional memory when extended memory is not available. With extended memory, the product requires 85K bytes. It can also create ZIP files that are larger than one disk.

A single copy costs $47.

Pkware
9025 N. Deerwood Drive
Brown Deer, Wis. 53223
(414) 354-8699

Macintosh products

Icom Simulations, Inc. has unveiled On Cue II.

On Cue II is an upgrade of the company's launching utility for Apple Computer, Inc. Macintoshes. Users can now launch project groups of multiple files and applications as well as access lists of their most recently used applications. On Cue II allows users to manage files without leaving the Macintosh desktop. Support for System 7.0 has been added.

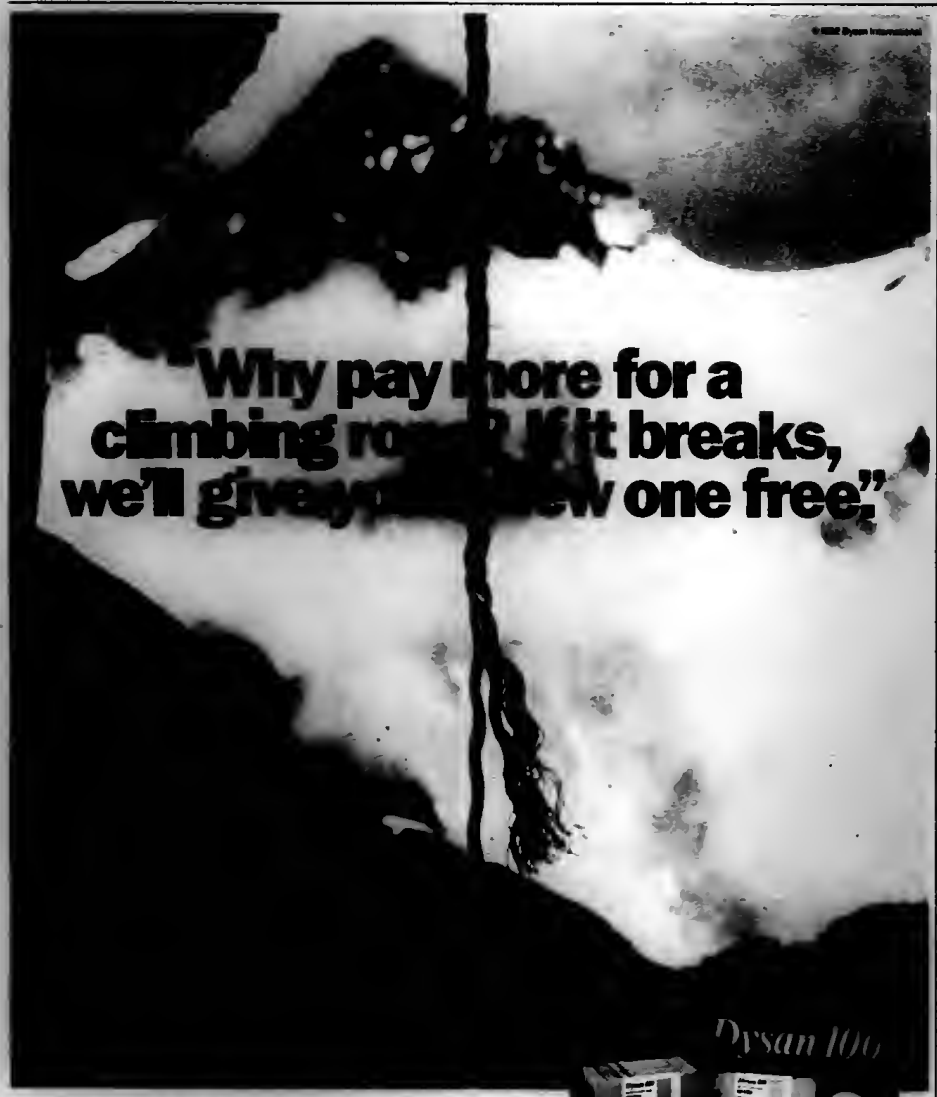
The product is priced at $99.95. Upgrades are available for $35.

Icom Simulations
648 S. Wheeling Road
Wheeling, Ill. 60090
(708) 520-4440

Claris Corp. has lowered the price of MacWrite II. The word processing software now costs $129, down from its previous price of $249.

Claris
P.O. Box 58168
5201 Patrick Henry Drive
Santa Clara, Calif. 95052
(408) 987-7000

More products on page 46



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Borland C++: Improved but not fully integrated

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Emily Leinfuss.

Borland International, Inc.'s C++ Version 3.0 programming environment improves on the strengths of the previous version but is not as integrated as it could be, according to reviewers.

Ease of use: Borland's C++ maintains a difficult balance between ease of use and power performance characteristics. Its Objectbrowser takes full advantage of Microsoft Corp.'s Windows, allowing users to visually browse through class hierarchies, functions and variables.

Environment: Version 3.0 does not implement a fully integrated Windows Integrated Development Environment (IDE).

Tools/Extensions: Borland has added features to its top-notch tool set, reviewers said, although one important new tool — Turbo C++ for Windows — suffers from the product's incomplete IDE.

Debugging: The turbo debugger now allows remote debugging over a NetBIOS network or serial links.

Value: Despite its drawbacks, reviewers called Borland C++ Version 3.0 a superior development system. List price is $495 or $749 with Borland's Application Frameworks.

Borland International's C++ 3.0

Reviews	Ease of use	Development environment	Tools/ Extensions	Debugging	Value	Overall
PC Week 12/9/91	Good	Good tools but not integrated	Good	Improved	Extra tools included	Clear-cut choice
Infoworld 2/3/92	Very good	Very good	Combines best tools in one package	One of the best	Excellent	8.7*
Windows Tech Journal 3/92	Easier to use	Produces faster code	Improvements galore	More sophisticated	Best package	Leads market
Users						
Rich Pickett, Oregon Institute of Technology	Very good	Very good	Very good	Very good	Very good	Excellent development environment
Frank Sarbanglo, Dean Witter	Very good	Very good	Very good	Very good	Good	Feature and tool rich
Analysts						
Neal Hill, Forrester Research, Inc.	Good	Very good	Good	Good	Very good	Head of the class
Chris Lotsco, Computer Intelligence/Infocorp	Very good	Good	Very good	Good	Good	Good language support
Arthur English, Digital Artistry	Very good	Far	Very good	Good	Very good	Good product, still a few bugs
Karen Offermann, Dataquest Information Services Group	Very good	Good	Very good	Good	Very good	A real challenger

Key: Very good, Good, Far, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC, No comment. *Infoworld rating based on a 1-to-10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Paul Johnson, First Boston Corp.	Very good	Good
John Maxwell III, Soundview Financial Group	Far	Very good

Borland International reported fourth-quarter 1991 revenue of $114.6 million, a 6.6 % decrease compared to 1990, and profit of $7.5 million, a 10% increase.

Borland responds

Michael Hyman, product manager:

Environment/Debugger: In general, Borland has consistently provided Windows-hosted C++ tools. We do provide a full-featured debugger for Windows applications. Windows IDE is the most far-reaching component there is, and we will continue to expand [our tools] in the future.

Zortech C++: Versatile but unrefined

Symantec's Zortech C++ 3.0

Reviews	Ease of use	Development environment	Tools/ Extensions	Debugging	Value	Overall
PC Week 10/4/91	Versatile, error-free	Complete support for Windows	Good	Flexible	Good	Fast, efficient
PC Magazine 11/12/91	Straight-forward	Covers major environments	Fast	Good; needs more environments	Extraordinary	Changes the competitive rules
Byte 1/92	Good	Supports Windows, OS/2 and DOS	Feature-rich	Does not debug 286 extenders	Good	Good package
Computer Language 9/91	NC	Multiple development platforms	Built-in Windows tools	NC	NC	NC
Users						
David Rogers, Aldus Corp.	Good	Far	Good	Very good	Very good	High quality code
Brian Misbach, Independent programmer	Very good	Good	NC	Far	NC	Likes the product
Mason Landstreet, Ladd Engineering Associates	Good	Poor	Very good	Very good	Very good	Versatile
Dietmar May, Performance Computing, Inc.	Good	Poor	Poor	Good	Very good	Most mature and stable
Analyst						
Chris Lotsco, Computer Intelligence/Infocorp	Good	Good	Good	Good	Good	Good reputation

Key: Very good, Good, Far, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Paul Johnson, First Boston Corp.	Very good	Very good
John Maxwell III, Soundview Financial Group	Very good	Very good

Symantec reported net revenue of $54.5 million and net income of $6.1 million for the third quarter of 1992, ending last December. Revenue increased 58% and income 74% compared to third-quarter 1991.

Symantec responds

Neil Goldman, product manager:

Debugger: We have heard customer feedback in a variety of different areas regarding Symantec's Zortech C++ environment. One area is extending the debugger to Rational and DOSX environments. We see this as a priority. An effort is already under way to do so.

Combining support of DOS, OS/2 and Microsoft Corp.'s Windows, among others, in its development environment makes Symantec Corp.'s recently acquired Zortech C++ Version 3.0 a strong competitor in the programming environment arena.

Ease of use: While praised for its support features, Zortech's Workbench integrated environment is unrefined with its reliance on pull-down rather than drop-down menus, reviewers said.

Environment: Replacing a group of packages that had to be purchased separately for each platform, Version 3.0 is versatile and complete in its support of Windows 3.0.

Tools/Extensions: *PC Magazine* was impressed with Zortech's tools, particularly the DOS extender components and its code generation.

Debugging: The debugger can be used for DOS, Windows, OS/2 or Phar Lap DOS extended program, but it cannot debug Rational or DOSX. Extending the debugging to those environments should be a priority, reviewers said.

Value: The product offers a high degree of versatility, error-free operation and efficient code generation, according to reviewers. It is an ambitious software development system, despite some flaws. The base package is priced at $399.95.

Development tools

Lucid, Inc. has upgraded Lucid Common LISP.

According to the company, Version 4.1 continues the product's migration toward the anticipated ANSI Common LISP standard. It provides an enhanced implementation of the Common LISP Object System and other improvements.

The software is available on Sun Microsystems, Inc. Scalable Processor Architecture systems at $4,400 for a full development license.

Lucid
707 Laurel St.
Menlo Park, Calif. 94025
(415) 329-8400

Intersolv, Inc. has created an applications design recovery product for DOS-based personal computers.

Design Recovery for DOS automatically records systems information into a computer-aided software engineering (CASE) environment. Information in the repository can be redeveloped using tools included with Design Recovery or with the company's Excelerator analysis and design tool. The product can also interact with other CASE tools via several formats.

The product is priced at $6,500 per user with volume discounts available.

Intersolv
3200 Tower Oaks Blvd.
Rockville, Md. 20852
(301) 230-3200

Frontier Software has announced Version 2.0 of FS:pascal, a 32-bit protected mode Pascal compiler.

The product allows programmers to use all extended memory available. It generates native 32-bit code, is compatible with Borland International, Inc.'s Turbo Pascal and includes more than 250 new library routines, the company reported.

FS:pascal costs $149.95. No runtime fees are required.

Frontier Software
Suite 2C
66-22 Fleet St.
Forest Hills, N.Y. 11375
(718) 520-4197

TechnoJock Software, Inc. has created a development kit that allows users to write spreadsheet applications for Lotus Development Corp.'s 1-2-3 for Windows using Borland International, Inc.'s Turbo Pascal for Windows.

Addvantage users can create @ functions, macro keywords and event-triggered applications. According to the company, it allows users to develop custom add-ins without requiring the Lotus 1-2-3 for Windows ADK.

Addvantage costs $495.

TechnoJock Software
Suite 900
531 Hunters Den
Houston, Texas 77079
(713) 493-6354

Systems

Wyse Technology, Inc. has announced the Decision 386/40.

The personal computer includes a multispeed XT/AT Bus, which can operate at 13.3 MHz, 10 MHz and 8 MHz. It also features seven expansion slots, 4M bytes of system memory and Microsoft Corp.'s MS-DOS 5.0.

A version with a 120M-byte hard drive costs $2,799. With a 200M-byte drive, the price is $3,399.

Wyse Technology
3741 N. First St.
San Jose, Calif. 95134
(408) 473-1200

Software applications packages

Business Forecast Systems has released Forecast Pro for Windows.

The software uses rules-based expert systems technology to forecast sales, revenue, interest rates and demand, based on input business data. It analyzes data and chooses the most appropriate forecasting technique, the company reported, and does not require users to have a knowledge of statistics.

Forecast Pro costs $695. Users of DOS versions can upgrade for $200.

Business Forecast Systems
68 Leonard St.
Belmont, Mass. 02178
(617) 484-5050

Systat, Inc. has released Fastat 2.0 for DOS, an upgrade of its statistical analysis software.

Fastat is intended for business professionals who lack an extensive knowledge of statistics, the company said. The new version provides pull-down menus and a spreadsheet-like interface for data entry. It can analyze files with up to 150 variables per session.

The software costs $495.

The company also announced Systat 5.2 for Apple Computer, Inc. Macintoshes. Systat is the company's high-end statistical analysis package.

Systat
1800 Sherman Ave.
Evanston, Ill. 60201
(708) 864-5670

Power Up Software Corp. has announced Formworx for DOS Version 3.0.

The upgrade provides mouse support, enhanced printing, database management and more than 100 form templates.

The product is priced at $159.95. Upgrades cost $39.

Power Up Software
2929 Campus Drive
San Mateo, Calif. 94403
(415) 345-5900

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From the analyst's viewpoint, there's a task-oriented menu system. Just point, click, and command the SAS System's most popular applications...without syntax and without relying on MIS or your Information Center staff. ▼

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NFORMATION DELIVERY

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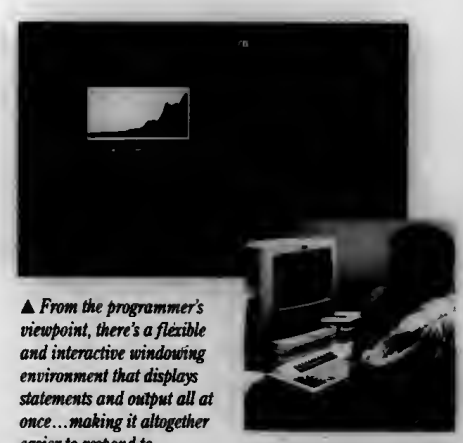

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Executive Information Systems

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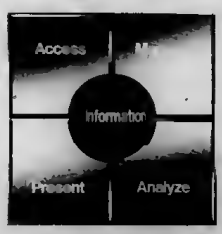
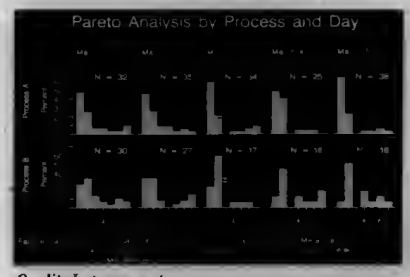
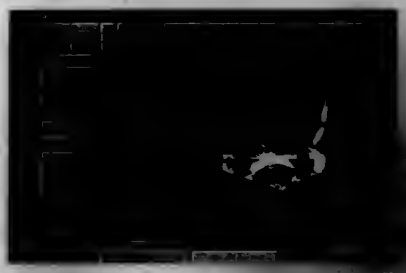


And we're setting the standard for multidimensional computer-generated graphs with the SAS System's new interactive graphics editor. Produce and modify graphics output using pre-built applications such as bar and pie charts, line graphs, scatter plots, maps, and more. And for real dazzle, there's a 3D facility for image modeling, rendering, and animation.



Quality Improvement



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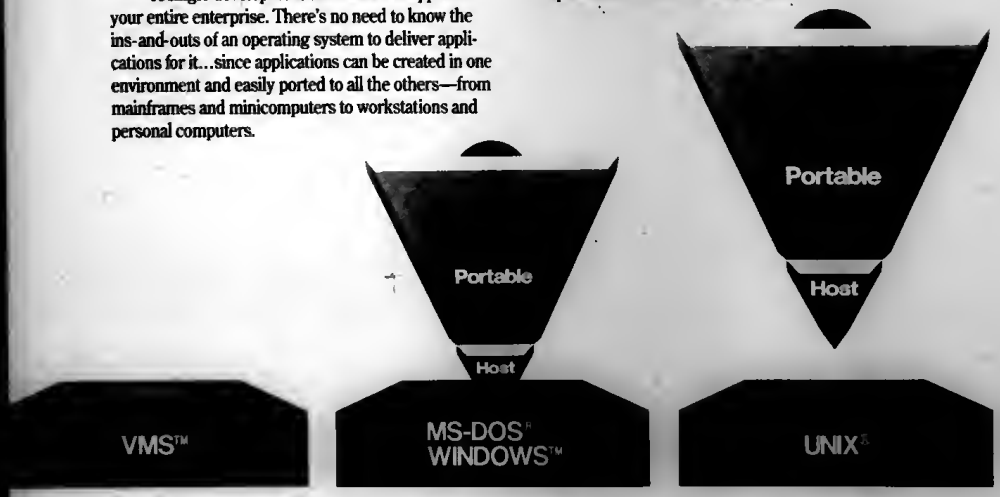

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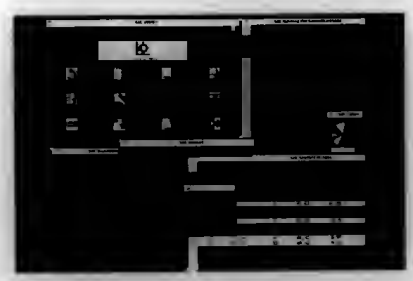

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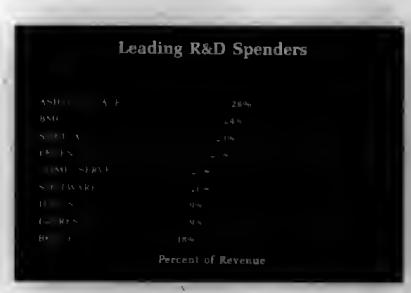

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Sun service aims to shine

BY MARYFRAN JOHNSON
CW STAFF

Aiming to clean up its spotty reputation for service and support, Sun Microsystems, Inc. last week revamped its U.S. reseller support programs, opened two new customer training centers and doubled the number of training courses offered at the centers.

During the past 18 months, Sun has hunkered down to deal with shortcomings in its customer support programs and invested "$10 million to $20 million" in the process, said Bill Cote, vice president of worldwide customer support at Sun.

"Part of [the criticism] we absolutely deserved," Cote said. "It's only in the last 18 months we've really put our money where our mouth is."

Within the next six months, for example, Sun will be sending all customers on maintenance contracts a compact disc loaded with service information, including reported bugs and fixes, a "symptom and cure" database and a collection of software technical bulletins.

Sun has also grown its roster of partnership agreements — for both hardware and software consulting — to include Bell Atlantic Business Systems Services, Eastman Kodak Co.'s Customer Equipment Service Division, Andersen Consulting and Cincinnati Bell Information Systems, Inc.

Some users report nothing but good experiences with their Sun support. Adaptive Corp. in Redwood City, Calif., for example, found that Sun's quick turnaround time on replacement parts was a key factor in keeping up with aggressive engineering schedules on its network of more than 100 Sun systems.

Other users, however, said they find fault with unresponsive sales representatives, delays in resolving software glitches and inadequate levels of expertise from Sun's telephone support hot line.

"They may actually be better organized from their own point of view, but I've found it's harder for highly qualified Unix people like myself to get rapid responses to questions," said R.P.C. Rodgers, an academic researcher affiliated with the University of California in San Francisco. "We found a kernel bug in Sun OS 4.1.1 that in Sun's early days would have taken three days to get a patch. It took three months now."

More engineering staff

Sun officials are hoping to cut down the lag time in connecting users to the appropriate expert by increasing the number of software engineers who staff the call-in centers — from 100 in 1990 to 450 in 1991. About 35% of the calls are now solved while the user is on the line, Cote said. Sun's goal is to solve 85% of the problems during that first call.

"That's a great goal. That's what I'm looking for," said Barbara Kostinick, MIS director at Consumer Health Services, Inc. in Boulder, Colo. The company now pays extra for a designated representative who knows specific details about Consumer Health's Sun network. "System administration is probably one of the hardest jobs in a Unix environment, and it really helps if they understand a bit more about your business," Kostinick noted.

"We've turned to an outside company for support of our hardware. It was a lot better deal for a lot less money," said Scott Grengs, project leader for a large Sun network at Northwest Airlines in Eagan, Minn. Northwest still relies on Sun for software support, however.

"When it comes to servicing business clients, they have to be more flexible in supporting us in whatever version of the hardware or software we're on," Grengs noted. "One problem I reported to them three months ago hasn't been worked on yet because we're not on SunOS 4.2 [the version of the operating system also called Solaris 1.0]."

The Problem	Sun's Response
Delays in getting timely and expert help from Sun's telephone support centers.	The help-desk support staff increased from 100 software engineers in 1990 to 450 in 1991.
Resellers complaining of costly up-front investment in spare parts required to become Sun partners and monthly limit of two calls for telephone support.	Reduced annual program fees, increased discounts on spare parts and switched to unlimited phone support.
Shortage of training courses and educational resources.	Increased training centers worldwide, from 16 in 1990 to 65 in 1991; doubled the number of courses offered in system administration, programming and networking.

CW Chart: Janell Genovese

Reseller input

To meet the demand for software support, Sun opted to expand its reseller and third-party support programs. After surveying its 900 resellers for advice, the company created new software services — Sun Support Line and Sun Support Line Plus — and expanded access to Sun's in-house resources with unlimited telephone support.

"With Support Line Plus, we are totally responsible for call-screening and managing end-user support," said Mike Shook, president of Strategic Technologies, Inc. (formerly CAD Systems of Carolina) in Raleigh, N.C. "Sun is handing the ball to us and saying: You get involved in the hot line support."

Resellers had been limited to providing only hardware support in the past three years, as Sun built up its indirect channels. Today, about 60% of Sun products are sold directly, and the rest go through third-party vendors.

"Sun basically wants a bunch of hometown people giving hometown support," said Shook, whose 20 employees manage 100 Sun customer sites in North Carolina. "This really gives the customer one line of contact and one source of responsibility."

Limiting resellers to hardware support only, Shook added, tended to fragment service offerings and forced customers to call a variety of sources when problems cropped up. Under the new programs, third-party vendors can be authorized to provide application software and operating system support as well.

Lotus, Borland clash on workgroup plans

BY ROSEMARY HAMILTON
CW STAFF

Lotus Development Corp. and Borland International, Inc. are pushing ahead with decidedly different approaches to workgroup computing.

At Esther Dyson's annual PC Forum, held in Tucson, Ariz., late last month, Lotus said it would be working with Action Technologies to bring work-flow capabilities to its Notes software. Meanwhile, Borland offered an outline of its workgroup strategy, which it suggests is superior to Lotus' Notes because it is more open and far-reaching.

However, Borland is still in the planning stage and is not yet ready to provide a delivery date for even the basic pieces of its workgroup strategy. Lotus, meanwhile, can now claim a user base of nearly 120,000 Notes users, according to June Rokoff, senior vice president at the Consulting Services Group.

Nonetheless, Borland is proceeding with an approach based on the belief that users do not necessarily want a complete workgroup application, like Notes, but would prefer extending their existing applications to a workgroup or collaborative environment.

Solution in a box

"There's a portion of the market that's interested in a packaged solution," said Paul Zagaeski, a senior analyst at The Yankee Group in Boston. "They think, 'Don't give me something I have to spend a year figuring out. Give me something I can set up now.' That's the Lotus solution."

Borland, however, is attempting to provide more of a "roll-your-own solution," Zagaeski added. "That has less appeal, but I want to emphasize what it does right now. Six months from now, the situation could be different. Borland could come up with something that's easy enough to do and flexible enough. Then,

Continued on page 51

FDDI group to choose twisted-pair speed

BY JOANIE M. WEXLER
CW STAFF

If the American National Standards Institute (ANSI) committee for Fiber Distributed Data Interface (FDDI) stays on schedule, products and standards for local 100M bit/sec. over datagrade copper wire could emerge by the end of the year.

The goal is to accommodate organizations that have high-quality twisted-pair wiring already installed. The technology would allow users to capitalize on such emerging applications as imaging while sidestepping the cost of pulling expensive fiber cable to every work area and investing in expensive fiber-optic networking components.

At its meeting last month, the ANSI committee said it intends to choose between two technology proposals for 100M bit/sec.-over-copper signaling when the group convenes again in April.

One for all

Floyd Ross, vice chairman of the FDDI committee, explained that one standard would cover both shielded twisted-pair and datagrade (Category 5) unshielded twisted pair, which be estimated together account for 80% to 90% of the copper wire currently installed.

However, it is not clear how many users are champing at the bit for 100M bit/sec.-to-the-desktop networking, particularly in light of the trouble they are having managing their much lower-speed networks.

"It's damn hard just to manage an Ethernet network. Life becomes very complicated when you start adding hundreds of connections, let alone increasing your bandwidth tenfold," said Bob Corre, director of special projects at New York University's Stern School of Business.

Corre pointed out that the in-

Continued on page 50

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Sun Microsystems
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*Sunsoft Inc. s Solaris 2.0 is scheduled for release in the first half of 1992.

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*The next generation of UNIX servers will yield even more powerful capabilities with the arrival of the next generation of client-server system software.**

Banyan users gain monitor options

BY JIM NASH
CW STAFF

Network managers pinched by budget constraints still have options when it comes to monitoring their Banyan Systems, Inc. servers. Until recently, they had been limited to very basic monitoring functions provided by Banyan or more expensive management software from third-party developers.

Winning praise among squeezed administrators is BanScan from TCE Technology Group. The San Jose, Calif.-based company has marketed BanScan as an alternative to Banyan's Vines Network Management service since last year.

"We were looking to get some indication of what our network was doing," said Frank Arlia, network services manager at Palo Alto, Calif.-based Varian Associates. "But the [available] products were either too expensive and complicated or not pertinent to our needs," Arlia said the radio-therapy device division of Varian picked up a beta test copy of BanScan about a year and a half ago.

BanScan Version 1.5 and BanScan for Windows, both introduced last September, automate the process of gathering basic network statistics such as collisions, traffic levels and hard disk use. The figures can be watched in real time and can be collected to find trends.

Vines Network Management displayed snapshots of network events when instructed to do so by an administrator. "That means we were using a human being or nothing to monitor the network," Arlia said. This was a tough situation for Varian, with 24 Banyan Vines servers and 700 workstations.

There are more advanced products out there, but they can cost several times more than BanScan, said Rob Sparre, network analyst at Delmarva Power & Light Co. in Newark, Del. BanScan costs $1,995 for a five-server license. BanScan Windows costs $2,490 for the same license. A 100-server license costs $4,995 and $5,490, respectively. Expose costs $1,495 per server, and Banyan's product is $995 per server.

Delmarva has 18 servers running Vines Version 4.10 or 4.11, supporting 500 workstations. That number will grow to 750 before spring, Sparre said, and monitoring will become more critical. "We made a futile attempt to use" Banyan's package before trying BanScan during a beta test 18 months ago, he said.

While largely satisfied with BanScan, Sparre said he wants the ability to set warning thresholds for individual devices. Now this function is global, which means that an alarm is generated whenever any server ends up spending 80% of its time routing, for example. One of his servers is primarily a router and would trip that alarm daily. Other servers would be burdened if they hit half that mark.

Larry Stouder, manager of technical development at Continental Grain Co. in New York, also praised BanScan for having the right amount of monitoring ability at an affordable price. He said, however, that the software-only product should be electronic-mail enabled in order to send alerts that can be saved until managers get to them. Now, an alert flashes on the screen and disappears.

All three administrators said the system would pay for itself the first time it warned of a trend that would cause a disk to crash.

FDDI committee

CONTINUED FROM PAGE 47

dustry needs more sophisticated capacity planning and analysis software tools to determine the impact of 100M bit/sec. speeds on their networks. He said that while the technology might be "attractive" to the school in 16 months, it would not be a necessity for two to three years.

Similarly, Edwin Riddle, head of the communications and network systems branch at NASA-Langley Research Center in Hampton, Va., said the capability would be "nice," but not a priority. He also said he is not sure if his copper wiring will qualify. "We put it in three years ago, but it's not the highest grade," he said.

There are also rumblings of standard Asynchronous Transfer Mode (ATM) cell-based networking entering the local area to seamlessly integrate with wide-area ATM networking. Some analysts and vendors said local ATM is likely to usurp both FDDI and its successor, FDDI-2, optimized for multimedia applications.

The ANSI selection in April between proposals from the Unshielded Twisted-Pair Development Forum and the team of Cabletron Systems, Inc. and National Semiconductor Corp. will be based on two months of round-robin testing at eight member companies, Ross said.

Second standard mulled

He added that work will continue in the background for voice-grade unshielded twisted-pair (Category 3 and below), though "it's not clear how much of the market is left. There is a question of whether it's worth doing a second standard."

Ross said the committee's work with 100M bit/sec. over lower-cost plastic fiber is "technically a done deal," and that the committee expects a completed standards document in April.

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3M Magnus 1.0 and 1.35 data cartridges require a compatible drive. Archive, Maynard, Sankyo, Tandberg, Tecmar and Wangtek have introduced gigabyte ¼-inch drives. ©3M 1992. Magnus is a trademark of 3M. 36USC 380

Lotus, Borland clash on workgroup plans

CONTINUED FROM PAGE 47

why would anyone want to buy a packaged solution?"

A key piece of the Borland plan is technology called the Object Exchange, which essentially will manage the workgroup environment, said Richard Schwartz, senior vice president and chief technical officer.

Object Exchange is code that will reside on the desktop and work with an Interbase database management system engine. It is an extension of the Borland Object Component Architecture, a recently announced strategy to build products with common objects and components. It will also be built on an Interbase engine.

Schwartz said the Object Exchange will serve as a user's link to the workgroup environment. Through this device, a user could request and receive objects from other applications. The Object Exchange will handle the transport issues of the workgroup as well, meaning it will be compatible with various electronic mail and other transport vehicles, Schwartz said.

Other applications would be able to participate in this workgroup if vendors write to the Object Exchange specifications.

While Borland did not provide a date for introducing the Object Exchange, Lotus said its goal is to deliver the results of its efforts with Action Technology by the end of 1992.

The two companies are working on a pilot project to bring the Action technology into Notes, said Brownell Chalstrom, director of technical marketing in the Communications Products Division.

Tom White, president of Action, said the two firms were "working with customers to see how much [of Action's technology] would be a core part of Notes [and] how much would be add-on."

Read for safety's sake

How secure is your Unix system?

If that question alone gives you the willies, the Security Alliance for Enterprise (SAFE) Computing group has a little something to suggest: a reading list.

The list was compiled from Unix System Laboratories, Inc.'s database last month after the inaugural meeting of SAFE, which formed in November 1991 to raise computer security awareness among users.

It includes the following books:

- *Unix System Security*, by Patrick H. Wood and Stephen G. Kochan (Hayden Book Co., 1985).
- *Unix System Security: How to Protect Your Data and Prevent Intruders*, by Rik Farrow (Addison-Wesley Publishing Co., 1991).
- *Practical Unix Security*, by Simson Garfinkel and Gene Spafford (O'Reilly & Associates, Inc., 1991).
- *Computers at Risk*, by the National Research Council (National Research Press, 1991).
- *Computer Security Basics*, by Deborah Russell and G.T. Gangemi Sr. (O'Reilly & Associates, Inc., 1991).

MARYFRAN JOHNSON

IN BRIEF

Beyond to support VIM

■ Electronic-mail vendor Beyond, Inc. in Cambridge, Mass., has said it will support the Vendor Independent Messaging (VIM) application programming interface in its BeyondMail product and other messaging applications. VIM is used for developing messaging- and mail-enabled applications. It was recently sanctioned by several major vendors, including Apple Computer, Inc. in Cupertino, Calif.; Borland International, Inc. in Scotts Valley, Calif.; Lotus Development Corp. in Cambridge; and Novell, Inc. in Provo, Utah.

■ Atlanta-based Solid Computer Corp. recently unveiled clones of Sun Microsystems, Inc.'s SPARCstation and IPC, with list prices 30% to 40% below Sun's prices. The SOLIDstation 40 and SOLIDstation 25 come in a basic configuration of a 207M-byte hard drive, a 19-in. color monitor, three S-Bus slots and a 25- or 40-MHz Scalable Processor Architecture chip.

■ Sybase, Inc. in Emeryville, Calif., has announced the availability of Release 4.8 of SQL Server, with support for symmetric multiprocessor systems on the AT&T Starserver E and Sun's Sun4/4000 and Sun4/600MP. Pricing for Release 4.8 ranges from $3,750 to $316,160, depending on the number and size of processors and the number of users.

■ IBM and MicroAge Computer Centers, Inc., have signed an agreement allowing MicroAge to resell IBM's RISC System/6000 workstations and the AIX operating system. MicroAge will provide technical and sales support for the systems, while IBM will provide installation, warranty and postwarranty service support for systems sold through MicroAge.

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NEW PRODUCTS

Software utilities

Microsystems Software, Inc. has created Adapta-LAN, a set of local-area network utilities that assist disabled employees.

The utilities include Magic, which magnifies screen display; Handishift, which helps users with limited typing skills; Handiphone, which simplifies telephone and modem access for users with physical limitations; and Seebeep, which provides a visual indicator of a personal computer beep for the hearing impaired. In all, the package has nine programs.

The Adapta-LAN package runs on the server and is priced at $2,995 per server, with an unlimited number of users.

Microsystems Software
600 Worcester Road
Framingham, Mass. 01701
(508) 879-9000

Local-area networking hardware

Xyplex, Inc. has announced a 16-port multiprotocol Ethernet communications server. The Maxserver 1600 connects terminals, personal computers, printers and other devices to an Ethernet local-area network.

It supports Transmission Control Protocol/Internet Protocol for communications with Unix systems and Local-Area Transport for communicating with VMS systems. Up to 5M bytes of single in-line memory modules can be included.

The price for a 1M-byte version is $3,195.

Xyplex
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

Electronic mail

Z-Code Software Corp. has announced Version 2.1 of its Z-Mail electronic mail management system for Unix.

Z-Mail supports X Window System and character-display interfaces. The new version offers more flexible configuration, dynamic font and color adjustment, improved file management and support for additional multimedia mail formats.

A five-user license costs $1,395; a 10-user license costs $2,495.

Z-Code Software
Suite B-50, 4340 Redwood Hwy.
San Rafael, Calif. 94904
(415) 499-8649

X Windows

Network Computing Devices, Inc. has introduced three high-resolution, reduced instruction set computing-based X terminals. The NCD19r ($2,895) is a monochrome X terminal based on the Mips Computer Systems, Inc. R3000 processor.

The NCD17g ($4,495) and NCD17cr ($5,395) are gray-scale and color models based on the Motorola, Inc. 88100 chip.

All three models feature 1,280- by 1,024-pixel resolution.

Network Computing Devices
350 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 694-0650

Human Designed Systems, Inc. has designed a low-cost line of reduced instruction set computing-based X terminals.

The Viewstation FX Monochrome Series models offer 15-, 17- and 19-in. displays and are based on the Intel Corp. I960CA processor. One parallel and two serial ports are included. Gray-scale models supporting 256 shades are available with monochrome models.

The FX15 with a flat-screen monitor costs $1,599. The FX19 costs $2,899.

Human Designed Systems
421 Feheley Drive
King of Prussia, Pa. 19406
(215) 277-8300

Systems

Novadyne Computer Systems, Inc. has designed a line of multiprocessor Unix-based systems.

The Series XT line runs a multithreaded version of Unix System V called Umax and the McDonnell Douglas Corp. Reality operating environment. It incorporates two or four reduced instruction set computing-based processors and provides symmetrical and parallel multiprocessing for workgroups of 64 to 256 simultaneous users.

Pricing ranges from $70,000 to approximately $200,000, depending on user requirements.

Novadyne Computer Systems
1700 E. St. Andrew Place
Santa Ana, Calif. 92705
(714) 566-3717

Data storage

Legacy Storage Systems, Inc. has developed the Legacy MASS HFD NetSpan storage system for Novell, Inc. NetWare local-area networks.

The small computer systems interface-based product provides redundant arrays of inexpensive disks Level 0, 1 or 5 storage, incorporating up to 12G bytes of data storage in one enclosure.

A standard configuration with six 480M-byte drives and a digital audio tape drive is priced at $24,799.

Legacy Storage Systems
Unit B, 200 Butterfield Drive
Ashland, Mass. 01721
(508) 881-6442

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NOVELL

The Past, Present, and Future of Network Computing.

IN BRIEF

Modular set offered

■ Companies can opt for a modular set of network services from GE Computer Service in Norcross, Ga. The vendor said it offers six outsourcing areas: network design and consulting; installation; recovery of critical network components; troubleshooting; predictive maintenance; and network administration.

■ United Telecommunications, Inc. in Kansas City, Mo., has changed its name to Sprint and its stock symbol from "UT" to "FON."

■ MCI Communications Corp. in Rye Brook, N.Y., said it has purchased development and publishing rights to several MCI Mail gateways from Solutions, Inc. The gateways convert Microsoft Corp. Mail for Apple Computer, Inc. AppleTalk networks to MCI Mail and Apple's Quickmail to MCI Mail.

■ AT&T Network Systems announced recently that it plans to deliver National ISDN-2 — an enhanced nationwide standard Integrated Services Digital Network to be deployed mid-1993 — on its 5ESS central-office switch.

Bridge-based hub segments campus net

BY JOANIE M. WEXLER
CW STAFF

RALEIGH, N.C. — A university that has been beta testing 3Com Corp.'a neophyte Linkbuilder 3GH intelligent wiring hub for two months reports that the product largely meets its goals of segmenting network traffic with a minimum of overhead.

However, North Carolina State University (NCSU) would like to see 3Com in Santa Clara, Calif., extend its internal Ethernet bridging concept to the 3GH's Fiber Distributed Data Interface (FDDI) modules, said Mohammad Fatmi, network analyst. The integrated bridging keeps local traffic from spilling unnecessarily onto the campus backbone, he explained.

Fatmi said there is also a compatibility glitch between Cisco Systems, Inc. bridge/routers, which NCSU has widely installed, and the hub's integral translation bridges. The Cisco devices are based on the older, encapsulation bridging scheme, which Cisco is expected to upgrade this month.

Campus connection

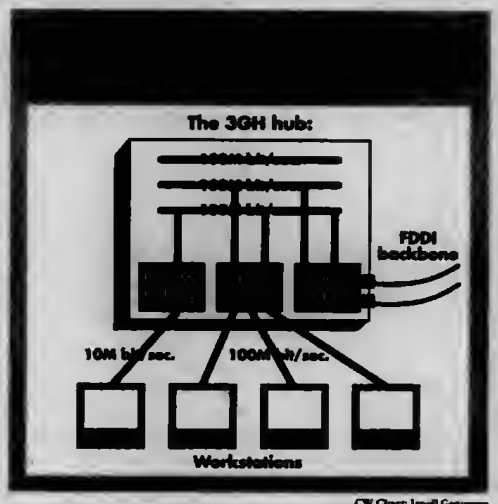
The university is currently linking 70 buildings using seven 3Com hubs connected by a 100M bit/sec. FDDI campus backbone. 3GH connects a variety of local Ethernet, Token Ring and FDDI networks, as well as dedicated local workstations.

The $27,500 to $150,000 3GH, which became available in December, is 3Com's contribution to the emerging "Ethernet extender" market via the intelligent wiring super hub. In this high-end market, the demarcation lines between smart hubs and internetworking devices are beginning to blur. In fact, Fatmi said, NCSU views the hub's wiring function as secondary to its internetworking capabilities.

Some midrange hubs incorporate bridging or routing modules simply as a way to consolidate boxes and save money. Others, such as 3Com's high-end 3GH, bundle internetworking functions right into the product's architecture. Vendors that have melded internetworking into the fabric of their hub architectures include Bytex Corp. in Westboro, Mass., Kalpana, Inc. in San Jose, Calif., and Ungermann-Bass, Inc. in Santa Clara, Calif.

The 3Com hub houses Ethernet-to-FDDI bridges, an FDDI concentrator and an FDDI direct dual attach module that links the hub to a physical FDDI backbone.

FDDI by definition includes two 100M bit/sec. counter-rotating rings: one primary ring for data transport and one for backup. The FDDI logical local network within 3Com's hub adds a third 100M bit/sec. "local" ring for testing so "you don't have to test FDDI workstations on the primary ring," Fatmi said. "If you did, and the machine was bad, your backbone would go down."



CW Chart: Janell Genovese

By placing an internal bridge at every Ethernet port in the hub, each end station can use the full 10M bit/sec. of an Ethernet local-area network's bandwidth, rather than sharing it.

"We want local traffic to stay local," Fatmi said. "We don't want unnecessary traffic from other network segments."

Typically, organizations use routers to create such "firewalls" between network segments for controlling network traffic flow. However, one problem with routers has been the added overhead caused by the address management function of the devices.

Built-in bridging, as a lower overhead alternative to routing, is used to segment networks in the 3Com hub in that each workstation or Ethernet segment gets its own in-hub bridge. Each 3GH Ethernet LAN Module supports eight ports, and each port can connect to a workstation or an Ethernet segment. Traffic does not use the hub's backplane if it is staying local.

No bridge too far

However, there is as yet no bridging on the FDDI concentrator or FDDI direct-attach module, Fatmi said. This means some backbone bandwidth is wasted on traffic that does not need to traverse it.

All FDDI stations connected to the FDDI concentrator module connect directly to the FDDI backbone, he explained, so if a workstation were powered or rebooted, "it would reset the entire FDDI backbone. That would result in dropped packets, retransmissions and increased overhead."

3Com is said to be working on a bridge for its FDDI backbone module, as well as internetworking capabilities for Token Ring networks.

"We're looking to bundle all that functionality in one spot," Fatmi said. "We have fewer points of failure that way."

Kapor's group urges ISDN for the masses

BY GARY H. ANTHES
CW STAFF

The Electronic Frontier Foundation (EFF) is rallying the computer industry around an effort to break a stalemate in telecommunications policy. It is calling on industry leaders to help define and lobby for an "open telecommunications platform."

One of several options the EFF is proposing is the rapid deployment of a nationwide, low-cost "personal" Integrated Services Digital Network (ISDN), a narrow-band technology that could bring interactive data services via existing copper lines to millions of homes and businesses. Because deployment of wide-band fiber optics will take many years and billions of dollars, EFF said, it is urging a "second look" at ISDN, which it concedes has been written off by some as too slow, too late.

EFF said the computer industry can bring to the effort the notion of open systems — something that so far has eluded the telephone companies.

Mitch Kapor, president of Cambridge, Mass.-based EFF, and Jerry Berman, director at the EFF's new Washington, D.C., office, recently met with and won pledges of support for the open platform initiative from executives at IBM, Apple Computer, Inc., Novell, Inc. and Microsoft Corp.

Kapor has won pledges of support

"Telecommunications has been in a deadlock for years, with publishers and others opposing [the provision of information services by] the regional Bell operating companies," Kapor said. "We haven't gotten a better communications infrastructure, and we haven't gotten more information services."

Last October, Kapor urged Congress to break the deadlock by mandating an open telecommunications platform based on narrow-band ISDN. That would put network applications such as imaging, which needs higher bandwidth than exists in conventional voice-grade lines, within the reach of many more users, he said.

Kapor said personal ISDN should be implemented as "an open platform in which anyone can come and put up a service." He said the personal computer industry grew to $100 billion in a little more than a decade because Apple and IBM provided open platforms on which developers could easily build applications.

Now, EFF said, it wants the computer industry to help bring that same philosophy to the telephone networks. The EFF proposal asks computer companies to join the Communications Policy Forum (CPF), an alliance of users and vendors that debate communications policy options and is coordinated by the EFF through its Washington office. The EFF is also asking companies to support its open platform proposal and to contribute technical resources to help define and implement it.

Continued on page 57

Sync Research provides missing link

Concentrators allow users to inexpensively link IBM SNA devices via X.25 or frame relay

BY ELISABETH HORWITT
CW STAFF

IRVINE, Calif. — Users will soon be able to link their IBM Systems Network Architecture (SNA) devices via either X.25 or frame-relay packet-switched protocols without the expense and overhead of IBM's Network Packet Switched Interface (NPSI) front-end processor program, according to vendor Sync Research, based here.

One prerequisite, however, is that the host is linked to a Token Ring local-area network.

The advantage of linking IBM SNA devices over frame relay or X.25 is the comparatively low cost of on-demand, packet-switched connections as compared with dedicated lines, Sync Research spokesman Lynn Nye said.

Concentrated conversion

An IBM host typically transmits over a Token Ring LAN using Logical Link Control (LLC) protocols. The new version of Sync Research's SNA Connection/Token Ring Concentrator (SNAC/TRC) is said to convert LLC transmissions to IBM's Qualified Logical Link Control (QLLC) format for transmission over an X.25 or frame-relay network.

The SNAC/TRC can link the hosts over an X.25 network to any other device that supports QLLC, including Eicon, Inc. LAN gateways, IBM 3174 Establishment Controllers, OS/2 Extended Edition workstations and certain X.25 packet assembler/disassembler devices, Nye said.

Sync Research's SNA Connection/Network Concentrator (SNAC/NTC) has also been enhanced to support QLLC-X.25 and frame-relay connections. This concentrator supports older IBM cluster controllers, such as the 3274, that do not support QLLC, Nye said. It also provides frame-relay connections for a range of other IBM controllers, such as the 3174, which do not inherently support frame relay, be added.

The SNAC/TRC supports up to four Line Communications Processors, each of which supports either one 128K or two 64K bit/sec. network links. The device supports a maximum of 60 virtual circuits, each of which links to a single cluster controller.

Sync Research plans to upgrade the Token Ring board to support 1.5M bit/sec. connections. However, Nye said the current 64K bit/sec. links are more than adequate for most host-to-cluster controller applications.

High costs

The SNAC/TRC targets users that have already linked their IBM hosts to Token Ring networks and do not want to spend $13,700 and up, plus monthly maintenance fees, for IBM's NPSI, according to Nye.

IBM has promised frame-relay support for its front-end processors by the third quarter. However, such links will only connect hosts to one another but not to remote terminal controllers, Nye said. IBM front ends that support IBM's upcoming link will not be able to communicate with Sync Research's frame-relay devices because the packet-switched protocol is still proprietary, be added.

The enhanced Network Concentrator is priced at $7,480; the enhanced Token Ring Concentrator costs $9,650. Both are slated for second-quarter delivery.

Multinationals eye inverse multiplexer

BY JOANIE M. WEXLER
CW STAFF

ALAMEDA, Calif. — Multinational firms averse to the comparatively high price tag of leased lines overseas reportedly can reap the economic benefits of on-demand network bandwidth via Ascend Communications, Inc.'s inverse multiplexer, which was made available recently in Europe, Asia and Australia.

Assuring users of a choice, Ascend competitors Teleos Communications, Inc., Promptus Communications, Inc., Newbridge Networks, Inc. and Network Express, Inc. are reportedly readying their inverse multiplexers for global certification as well.

Inverse multiplexing is a scheme through which applications dial into a device such as Ascend's Multiband Controller, which apportions traffic to various switched public services. The device aggregates the required amount of bandwidth for each application as needed. This precludes companies from footing the bill for dedicated lines that are not cost-justified by traffic volume.

"Overseas, you can use dial-up services for hours and hours before reaching the break-even point of a dedicated line," explained Jennifer Pigg, data communications program manager at The Yankee Group in Boston.

Ascend said it has been working since its 1988 inception to form global alliances with resellers and foreign telecommunications authorities in order to meet international protocol standards and get its equipment certified overseas.

> "ISDN IS SO cheap in the UK; it's the same as a regular phone line."
>
> TOM FARLEY
> WILLIS COROON

Of particular interest to at least two Ascend users are the overseas equipments' Integrated Services Digital Network (ISDN) interfaces, because ISDN is the switched service of choice in countries such as the UK and France. "ISDN is so cheap in the UK; it's the same as a regular phone line," said Tom Farley, assistant vice president for telecommunications at the New York office of Willis Coroon Corp., the world's fourth largest insurance broker.

Farley said he plans to install videoconferencing globally this month, and with his current videoconference setup with London, "the English side is my cheap side." Instead of paying about $4,000 per month for one 64K bit/sec. leased line in England, he is spending $600 each month for aggregating three to four 64K bit/sec. switched lines when he needs them using the Ascend box.

Michael Irving, telecommunications manager at Conner Peripherals, Inc. in San Jose, Calif., is anxiously awaiting Ascend product certification in Singapore, where ISDN is also available, for use in his videoconference network. This is because he would like to occasionally combine three comparatively inexpensive 128K bit/sec. ISDN lines for 384K bit/sec. of bandwidth to upgrade videoconference quality.

"You can't do that [aggregate bandwidth] with switched 56K service," he said. He noted, however, that a dedicated 112K bit/sec. circuit from San Jose to Singapore from AT&T costs about $14,000 a month, "and we didn't expect to use that much video."

He said his ability to dial up public services on demand with the inverse multiplexer has pared that cost to $5,000 a month.

With last month's announcement, Ascend's inverse multiplexers are now certified to run in the U.S., the UK, France, Belgium, Japan, Taiwan and Australia.

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Software squeezes capacity from wireless nets

BY ELLIS BOOKER
CW STAFF

For all the freedom of movement they provide, wireless wide-area networks are seriously constrained by a lack of speed.

At the moment, for example, the two leading nationwide wireless networks — those from Ardis and Ram Mobile Data, Inc. — offer speeds of 4.8K and 8K bit/sec., respectively. The actual speed available to end users is far less than this, however, because the error-correction protocols for wireless networks eat up about half this bandwidth.

In addition, wireless data networks based on packet-switching technology allocate this transmission pipeline among all the users on the service at any given time. Carriers can, however, add capacity by increasing the number of shared channels on their networks. They are limited only by the relatively narrow radio frequency band now available to them.

The end result is that wireless networks, while acceptable for some applications involving "bursty transmissions" such as electronic mail or document interchange, are deemed prohibitively slow for large file transfers and the transmission of graphics.

A related problem is the way applications have been developed. "Designers weren't thinking about these limitations when they built their host-based or LAN-based systems," noted Lew Shepherdson, vice president of technology at Simware, Inc.

Had they anticipated these remote users, he added, they would never have designed host-based E-mail systems that require the user to "flip through several screens" to add a new name to a personal address book.

Simware, an Ottawa developer of mainframe-to-workstation connectivity software, has carved out a niche for itself by adapting its SplitSecond software to wireless environments. SplitSecond is a front-end product for workstations tapping into hosts that masks users from mainframe screens.

SplitSecond RF is designed to reduce the network traffic between the host and the workstation or mobile computer by as much as 70%. It does this, in part, by storing host screens on the remote personal computer and transmitting only changed data.

Simware announced its software for wireless host-to-portable connectivity in late January; the product will be available this month. Pricing has not yet been set.

Open season

"We are not aware of any direct competitors to them at this time," said David Mack, vice president of business services at Workgroup Technologies, Inc.; a consulting firm in Hampton, N.H. "Certainly they've gotten the jump in the marketplace."

But Mack said he thinks information systems managers who have lived through 15 years or so of cobbling together conventional wide- and local-area data networks will resist a leap to wireless facilities unless they can be assured that data flows accurately.

For this reason, he expects that Simware's numerous co-marketing and development partnerships with wireless carriers will be a model for the wireless industry in the future. Increasingly, "wireless will be sold as a turnkey application," he said.

In the past two months, in fact, Simware has signed agreements with RAM Mobile Data and Advanced Radio Data Information Services, the wireless packet data network launched by Motorola, Inc. and IBM in mid-1990.

Last year, it signed agreements with Motorola's Mobile Data Division and Ericsson GE Mobile Data, Inc.

System bars Internet intruders

BY MICHAEL ALEXANDER
CW STAFF

WILMINGTON, Del. — Raptor Systems, Inc., a tiny start-up based here, has created industrial-strength protection against professional intruders who ply their trade on the Internet.

The company is marketing a sophisticated system of hardware and software called the Eagle Network Isolator, which is especially aimed at organizations with links to Internet.

"Because of the vulnerability of LANs attached to the Internet, companies were shutting off their communications or deciding not to connect to the Internet," said John Shepard, president of Raptor. "The result of that is you get data rot: You can't communicate it, can't share it, can't collaborate, and that negatively impacts productivity."

Raptor's security system, which sells for $75,000, is built on clones of two Sun Microsystems, Inc. SPARCstations and the company's Eagle software. The software can be purchased separately for $60,000.

The system is designed to thwart "crackers" rather than "hackers," Shepard said. " 'Cracker' implies that somebody has targeted you: They are going to come in and disclose, modify or destroy data. A 'hacker' implies a curious looker."

One SPARCstation, which the company calls the "Gateway" — or "G box" for short — acts as a sort of firewall between the organization's local-area networks and the Internet, Shepard said.

The G Box has the responsibility of taking packets off the Internet and handing them over to the LAN or vice versa. Rather than blindly moving packets, the G box opens them and examines them. Only certain packet types — Telnet and File Transfer Protocol, for example — are permitted to be moved.

Only authorized outsiders may connect to an organization's LAN, and they must have permission that is based in part on their network addresses, the time of day that services are requested and other factors. Authorizations are handled by the second SPARCstation.

Delmarva Power & Light Co., based in Newark, Del., would not have links to the Internet if it had not acquired the Eagle system, said John Scoggin, supervisor of network operations at the utility. "We're very cautious about our Internet connection or any other connection to any public network," Scoggin said. "Before I could [have] an Internet connection, I had to have some form of protection."

The utility is connected to the Internet "primarily because a growing number of our vendors are," Scoggin said. "We get some of our technical support through that means." The utility "taps the knowledge base" at universities, research laboratories and other sites connected to the network, Scoggin added.

Group urges ISDN for the masses

CONTINUED FROM PAGE 55

David C. Nagel, senior vice president in the Advanced Technology Group at Apple, said Apple will support the CPF. He said Apple had not yet taken a position on personal ISDN, but he agreed it was one of several possible ways to give users new capabilities while waiting for a universal rollout of fiber optics.

Nagel said the EFF approach, whether ISDN or something else, is to put lower bandwidth services in place fairly quickly, then use the economic benefits from those to justify and help fund further development of the network.

He said he agreed that the computer industry has been underrepresented in telecommunications policy matters.

"We can educate people about the virtues of the open platform approach. The [telephone companies] have generally approached things from the standpoint of the intelligent network, where instead of an open platform you had a closed platform and all the interesting things were done at the central switch," Nagel said.

"This is spectacular for users because many things users want to do are constrained by bandwidth," said Jonathan Lazarus, general manager of systems marketing at Microsoft.

The EFF proposal would bring bandwidth at 56K bit/sec. and higher to the home, enabling many new applications, he said.

However, Michael Roberts, networking vice president at Educom, a 600-member association of colleges and universities, said the rollout of personal ISDN would be costly, would take until the end of the decade and would only divert the industry from better long-term solutions. "Japan and Europe would say, 'Thanks, you gave us eight years of breathing room screwing around with copper while we put in fiber.' "

John Eaude

Berman: *Winning pledges of support*

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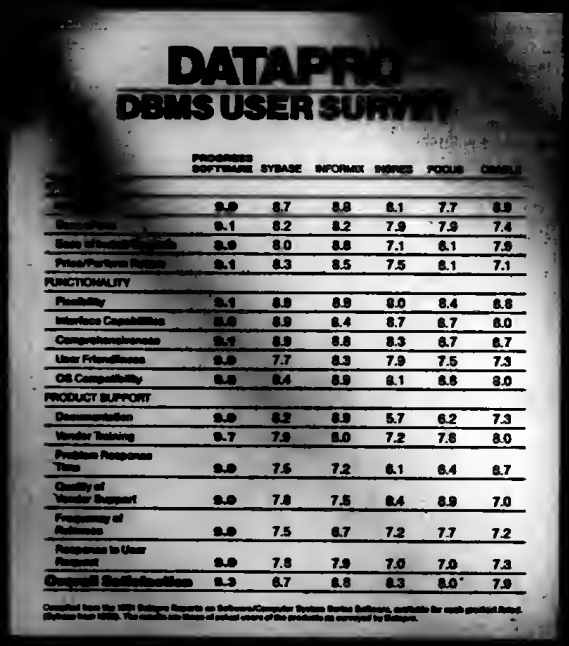
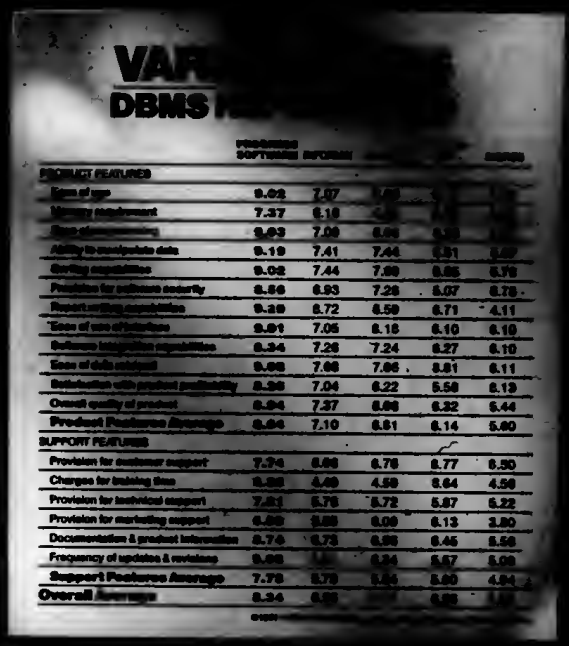


DATAPRO
DBMS USER SURVEY

	PROGRESS SOFTWARE	SYBASE	INFORMIX	INGRES	FOCUS	ORACLE
[illegible]	9.0	8.7	8.8	8.1	7.7	8.9
[illegible]	9.1	8.2	8.2	7.9	7.9	7.4
Ease of [illegible]	8.9	8.0	8.8	7.1	8.1	7.9
Price/Performance Ratio	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.9	8.9	8.0	8.4	8.8
Interface Capabilities	8.8	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.9	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	8.8	8.4	8.9	8.1	8.6	8.0
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.9	5.7	6.2	7.3
Vendor Training	8.7	7.9	8.0	7.2	7.8	8.0
Problem Response Time	8.9	7.5	7.2	8.1	8.4	8.7
Quality of Vendor Support	8.9	7.8	7.5	8.4	8.9	7.0
Frequency of Releases	8.9	7.5	8.7	7.2	7.7	7.2
Response to User Request	8.9	7.8	7.9	7.0	7.0	7.3
Overall Satisfaction	9.3	8.7	8.8	8.3	8.0	7.9

Compiled from the 1991 Datapro Reports on Software/Computer System Series Software, available for each product listed. (Software base 1000). The results are those of actual users of the products as surveyed by Datapro.



VAR[illegible]
DBMS [illegible]

	PROGRESS SOFTWARE	INFORMIX	[illegible]	[illegible]	INGRES
PRODUCT FEATURES					
Ease of use	9.02	7.07	[illegible]	[illegible]	[illegible]
Memory management	7.37	6.18	[illegible]	[illegible]	[illegible]
Data dictionaries	9.03	7.09	8.08	[illegible]	[illegible]
Ability to manipulate data	9.19	7.41	7.44	6.91	[illegible]
Sorting capabilities	9.02	7.44	7.80	8.85	6.70
Provision for software security	8.86	6.93	7.28	5.07	6.78
Report writing capabilities	9.20	6.72	8.50	6.71	4.11
Ease of use of functions	9.01	7.05	8.18	6.10	6.10
Software integration capabilities	8.34	7.28	7.24	6.27	6.10
Ease of data output	9.08	7.08	7.06	8.81	6.11
Satisfaction with product productivity	8.38	7.04	6.22	5.58	6.13
Overall quality of product	8.94	7.37	6.98	6.32	5.44
Product Features Average	8.94	7.10	6.81	6.14	5.80
SUPPORT FEATURES					
Provision for customer support	7.74	6.06	6.76	6.77	6.30
Charges for training time	8.88	4.40	4.50	6.64	4.50
Provision for technical support	7.81	6.76	5.72	5.87	5.22
Provision for marketing support	6.80	3.85	6.00	6.13	3.80
Documentation & product information	8.74	6.73	6.98	6.45	5.56
Frequency of updates & revisions	8.08	[illegible]	6.24	5.67	5.00
Support Features Average	7.78	5.78	5.86	5.80	4.84
Overall Average	8.34	6.98	[illegible]	6.08	[illegible]

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CPWADV0309

Users feel pinch of rivals turned allies

BY SALLY CUSACK
CW STAFF

A series of agreements and alliances have left former rivals in the medium- and large-system memory and storage games in a position where they are no longer competing for the same customer dollars.

This new esprit de corps among the vendors will most likely result in higher prices for users.

Through recent agreements with adversary EMC Corp., Cambex Corp. stands virtually alone in supplying memory for IBM-compatible water-cooled mainframes. A report released by Technology Investment Strategies Corp. (TISC) in London says Cambex will pay $11.5 million for EMC's IBM 3090 and Enterprise System/9000 memory technology, and EMC has purchased Cambex's emerging air-cooled ES/9121 memory business for $500,000.

Monopoly pricing

This elimination of competition in the same market area will result in higher prices for the end-user community, said Mark Vargo, a senior research analyst at TISC.

He pointed out that this industry reorganization leaves Cambex virtually unchallenged at the high-end mainframe level, while EMC could dominate the IBM Application System/400 and "midframe" arena.

Users, however, seemed unconcerned that prices would rise too high, at least in the near future.

"I'm assuming IBM's recent discounts and announcements in the midrange area will help to drive third-party prices down," said David Gooch, divisional MIS manager at the Mathews Conveyer Division of Babcock Industries, Inc. in Danville, Ky.

Gooch, who has been using EMC products in an IBM System/38 environment, said he spoke with his EMC sales representative just after the IBM AS/400 E series announcements last month. The EMC rep could not quote a price on products at that point, Gooch said, because he did not know how the company would react to the IBM announcement.

Happy customer

Jerry Frucht, vice president of information systems at Variety Wholesalers, Inc., a retail chain based in Raleigh, N.C., has been using EMC and IBM products for some time. The firm is moving its 500-plus retail stores off of an IBM System/38 architecture and onto one of the AS/400 E series platforms. Variety Wholesalers will evaluate memory upgrades in the future, Frucht said.

"Right now, we are evaluating which disk drives to use on the AS/400. We are happy with products from both companies, but IBM is coming up with creative ways of pricing a total system to be competitive," he said.

The memory market has already been affected by rising prices stemming from the recent exposure of allegedly bogus used memory marketed as original IBM memory, according to Varga. This has made the price of IBM memory skyrocket.

Other factors include a pending distribution agreement between Cambex and Storage Technology Corp. Though the details have not been completely ironed out yet, the TISC report predicts it will "boost Cambex's reputation in those glass-house accounts where it normally was not welcome."

IBM to halt upgrades

IBM will stop selling approximately 115 upgrades among its mainframe product lines by year's end, a company spokeswoman confirmed last week.

The company also announced that old 3090s can be traded in for Enterprise System/9000s. Previously, only users of older mainframes, including the 3083 and 4381, were able to swap their old computers for the ES/9000 family.

Some of the withdrawn upgrades are between the older 3090 family and the newer ES/9000 line; others are within the 3090 line entirely.

The IBM spokeswoman said the move is being made because "the 3090 customers who want to upgrade have already done so."

The majority of the upgrade packages being withdrawn — 85 of the total — will no longer be available after Sept. 30. The rest will be sold until year's end. Users have until those dates to put their orders in, but they may opt for later delivery.

Even so, IBM warned, supply of the withdrawn products is limited.

If users do not make the deadline, they will have to swap boxes entirely — rather than simply upgrade — to move from the 3090 to the ES/9000.

JOHANNA AMBROSIO

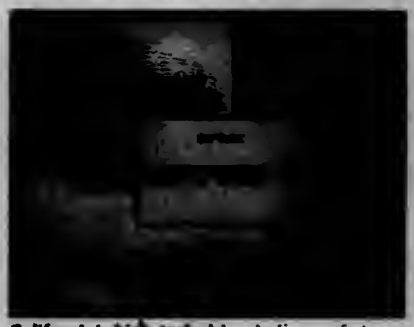
New Calif. license speeds law

BY ELLIS BOOKER
CW STAFF

SACRAMENTO, Calif. — *"May I see your license, please."*

While it may be cold comfort to speeders, there is a one in four chance that the driver's licenses they hand over to a police officer will be the most advanced in the country.

The California driver's license system, the first of its kind in the nation, has already improved the efficiency of the state's Department of Motor Vehicles (DMV) and promises to speed up law enforcement agencies that require access to driver's license information.



California's high-tech driver's licenses feature a fingerprint and color photo, which is stored on-line

California citizens will benefit, too. Because the magnetic stripe on the so-called driver's license/identification is compatible with general-purpose card readers used today by many retailers and supermarkets, these cards could speed up lines at cash registers when consumers are asked to present their identification.

Nearly a year after expanding its statewide driver's license system to include an image database of digitized

To page 64

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APPLICATION DEVELOPMENT

IN BRIEF

NCR users receive aid

■ **NCR Corp.** signed a service deal with Southfield, Mich.-based **Computer & Engineering Consultants Ltd.** (CEC) whereby the firm will help NCR users build and manage information systems by using the Information Engineering (IE) methodology. The service is aimed at users doing business process redesign and data flow planning.

■ **Advanced Development Methods, Inc.** unveiled a new version of its on-line computer-aided software engineering (CASE) methodology manager, incorporating project management templates and support for Ernst & Young's Navigator method. Mate, which runs under IBM's OS/2 or Microsoft Corp.'s Windows 3.0, supports CASE tools using structured and IE methodologies.

■ **IBM** will start selling CASE tools from closely held Seer Technologies, Inc. The Cary, N.C.-based company makes application development products, such as the High Productivity Systems (HPS) environment, for banks, brokerage houses and other financial services firms. Seer said it plans to enhance HPS to let it exchange design specifications and other information with IBM's AD/Cycle code generator.

■ **Andersen Consulting** announced a service for helping users plan and build cooperative processing applications using Andersen's Foundation CASE workbench. Besides product training, the Chicago firm will provide help with managing the cultural changes that accompany software development using CASE. Andersen also announced a four-day training school in St. Charles, Ill., to teach Foundation CASE users about client/server development.

Sapiens debuts Windows conversion tool

BY CHRISTOPHER LINDQUIST
CW STAFF

CARY, N.C. — Sapiens USA, Inc., the recently created U.S. subsidiary of Sapiens International Corp., has announced the availability of a product that converts text-mode applications written with the Sapiens rule-based, object-oriented development tools into client/server applications running under Microsoft Corp.'s Windows without further programming.

Sapiens Workstation provides an automatic transition from a strictly mainframe-based application to a cooperative processing arrangement. Sapiens Workstation accomplishes this by taking the segments of the Sapiens application's knowledge base that control screen information and placing them on the workstation. This improves response times, the company said.

Once converted, the applications also take advantage of Windows features such as pull-down menus.

Sapiens Workstation *converts text-mode applications into Windows-based client/server applications*

The Sapiens development tools allow applications to be built using business rules instead of codes. As rules change or are added, the application can be modified, with Sapiens managing the relationships between the rules without user intervention.

"It's a pretty impressive product," said Bill Martorelli, vice president and research director at New Science Associates, Inc. in Southport, Conn. He said the Sapiens tools give a good path to "evolutionary" development, where functionality can be built into an application quickly and then expanded as needs dictate, preventing users from having to rebuild applications constantly.

Peter Kastner, vice president of Aberdeen Group, a consulting and analysis firm in Boston, said that while many development tool vendors will probably claim to have the features of Sapiens tools and the Sapiens Workstation, including object orientation and client/server architecture, he has not seen any that do.

Sapiens development tools run on IBM mainframes under several operating systems, including VM, MVS and VSE. Pricing for Sapiens tools ranges from $65,800 to $765,800, depending on processor and number of users. Sapiens Workstation ranges in price from $750 to $1,500, depending on volume.

Mewel 3.4 offers portability, savings

BY CHRISTOPHER LINDQUIST
CW STAFF

MILLBURN, N.J. — Avoiding duplication of effort in applications development can save a company time and money. Being able to write an application once and then easily port it to a variety of platforms, ideally by simply recompiling the code, is one of the easiest ways to avoid such duplication. That is the goal of the Mewel window library from Magma Software Systems.

Mewel Version 3.4 allows programmers to write one set of source code, then move it to DOS, OS/2, Unix, VAX/VMS or Microsoft Corp.'s Windows by relinking to the appropriate library, according to Magma. Mewel is Common User Access-compliant and conforms to the Windows application programming interface, allowing users to port applications from Windows to the other platforms quickly.

Brendan Chaplin, a team leader in the technical computing group at Exxon Corp., said his group has used Mewel to develop some 25 applications, though the first step was to write a tool kit around it. "As with any Windows code, it's a pain to write at the low level," he said.

However, he added that Mewel makes an ideal training ground for Windows developers: "There's been no problem taking people who've been using Mewel and moving them to Windows," he said.

Vinnie Finn, a contractor at Finware, Inc., is using Mewel on several projects, including a computerized slide projector control for Eastman Kodak Co. Finn said he has found that Mewel allows him to create a "nicer" user interface than he would normally create on his own.

Finn has also ported a Windows program to DOS using Mewel.

The MS-DOS version of Mewel Version 3.4 costs $295 without source code. A version with source code is available for $595. Prices for OS/2, Unix and VMS versions are available.

Netron introduces PC-based GUI builder

BY KIM S. NASH
CW STAFF

TORONTO — Netron, Inc. recently announced an OS/2 Presentation Manager version of Netron/Cap, a personal computer-based graphical user interface (GUI) builder.

In addition, a Microsoft Corp. Windows edition of the product is scheduled for general release by June, company officials said.

GUI builders have become a popular way to make host-based applications easily accessible for end users. However, Netron/Cap for Presentation Manager lets developers create full-blown applications as well as interfaces, according to David Patterson, vice president of information technology services at Dun & Bradstreet Canada, a division of Dun & Bradstreet Software.

Nationwide system

D&B Canada bought Netron/Cap for Presentation Manager in July 1991 to implement a countrywide customer information system that uses an IBM Personal System/2-based client/server architecture. The product lets the company "reduce our training needs to almost zero," Patterson said.

Several major computer-aided software engineering companies have released GUI builders, including Texas Instruments, Inc. and CGI Systems, Inc.

Netron/Cap for Presentation Manager is priced at $1,000 per copy for users of the OS/2 version and $9,000 for new users. A Netron/Cap starter kit is available for $65,000.

More support for SunSoft's ToolTalk

BY MARYFRAN JOHNSON
CW STAFF

Silicon Graphics, Inc. recently joined the list of vendors endorsing SunSoft, Inc.'s ToolTalk, an object-oriented software tool that allows applications to communicate across multiple platforms.

ToolTalk was introduced by Sun Microsystems, Inc.'s SunSoft subsidiary in June 1991. It links applications so that when data is modified in one application, it is automatically updated in the others.

By year's end, Silicon Graphics will be shipping ToolTalk on its Iris four-dimensional workstations. "ToolTalk provides an integration mechanism for Silicon Graphics and third-party software," said Jim Barton, a company vice president.

SunSoft has also signed on a host of supporters for ToolTalk, including Lotus Development Corp., Cadence Design Systems, Inc. and Frame Technology Corp.

ToolTalk is bundled with the Solaris 1.0 and upcoming Solaris 2.0 operating systems as a system service. Third-party developers will be building ToolTalk capability into their applications.

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Calif. license speeds law

CONTINUED FROM PAGE 59

color photographs, fingerprints and signatures, the California DMV, with about 20 million licensed drivers, has placed about 5 million of the credit card-size licenses on the road.

The high-tech licenses feature a security hologram in the form of a see-through state emblem and a data-packed magnetic stripe, as well as the traditional color photograph, signature, fingerprint and written information.

However, because the image portion of the cards are digitized representations and the cards feature a magnetic stripe containing the driver's date of birth, license plate number and license expiration date, the cards offer a host of advantages to the DMV, the police and, in the near future, the consumers who will use them for identification at retail and grocery stores.

Increased convenience

For the DMV, the system has provided better quality images and has saved time. "Just doing away with the ink for the fingerprinting has saved seconds," said Anthony Walker, manager of systems development at the DMV.

More importantly, Walker said, now that the images are available on-line, agents at the DMV's main facility here can retrieve and send them to law enforcement and government agencies for identification purposes much more conveniently.

Under the old system, the DMV staff, which processes some 20,000 to 30,000 of these requests every month, first had to go through the labor-intensive business of physically locating a particular microfilm record. An added problem was the occasional poor quality of the resulting 2-sq-in. black and white photographs.

By comparison, the image system produces a crisp color image that can be viewed on screen or output to a color laser printer in less than one minute.

To retrieve the image, DMV agents log on to the image database maintained at the card-processing center of NBS Imaging Systems, Inc. NBS, based in Fort Wayne, Ind., has been producing California's licenses and ID cards since 1961 and was named the prime contractor for the $29 million, five-year California DMV project.

Group effort

NBS' subcontractors for the project include IBM, which provided two IBM 9370 mainframes as host computers for the image database, and PI Technology in Simi Valley, Calif., which provided the image database application as well as the high-capacity, 14-in. optical disc libraries from Eastman Kodak Co.'s Commercial Imaging Group.

A new card, at an average price of 74 cents to the state, takes about 16 to 17 days to deliver to a citizen — about the same as under the old system.

Although only DMV office is directly connected to the NBS image database today, Walker said the ultimate goal is to give authorized law enforcement agencies remote access to the system over the California Law Enforcement Telecommunications System (CLETS).

> "THE SYSTEM HAS provided better quality images and has saved time. Just doing away with the ink for the fingerprinting has saved seconds."
>
> ANTHONY WALKER
> CALIFORNIA DMV

"A major problem is the size of the image record, which is about 25K [bytes]," Walker said, adding that at CLETS' current speed of 9.6K bit/sec., image transmissions are not suitable. He noted, however, that there is talk of increasing the CLETS backbone to 56K bit/sec. or even T1 speeds, which would allow image file transfers.

Further expansion

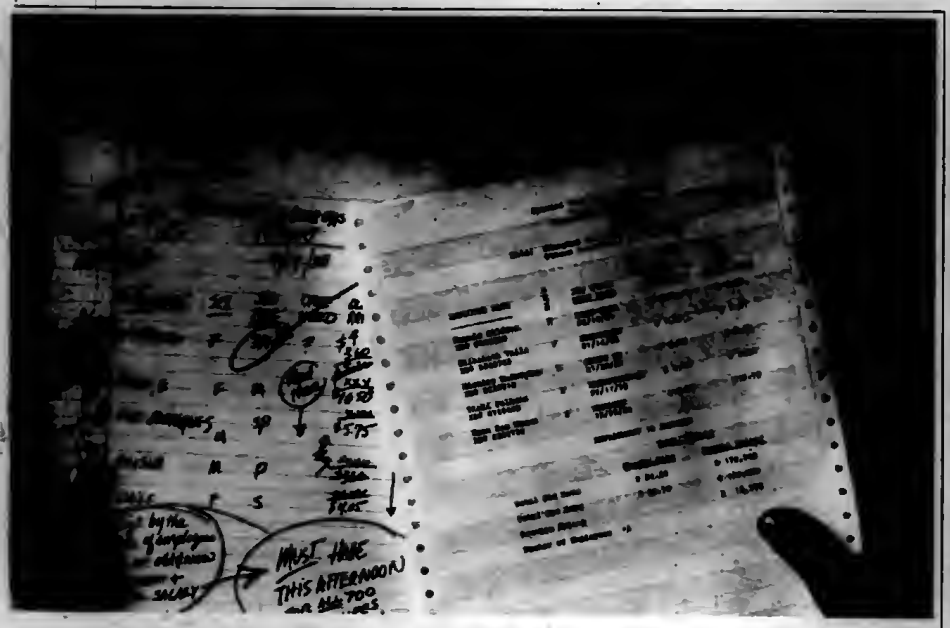
In the future, the new license application could benefit California's commercial establishments, such as retail stores and banks, which could adapt the software of their existing card readers to grab the driver information contained on the license's magnetic stripe. "I've had numerous conversations with some big chains in the state . . . and I know some of them have developed software for this application," Walker said.

And what about being pulled over for speeding?

In Ventura County, the California highway patrol is currently piloting a handheld device containing a card reader that can scan the license and pick up 60% of the needed information for a ticket. The speeder gets a printout, and the handheld terminal later downloads the citation directly into the traffic ticket system, skipping the need for a paper record.

A decision on whether to take that system statewide is expected this month, Walker said.

The DMV said it expects to issue upwards of 40 million new and renewal licenses and ID cards over the next five years.



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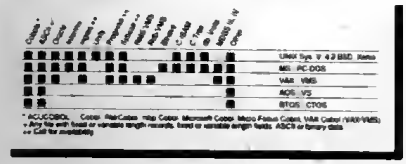

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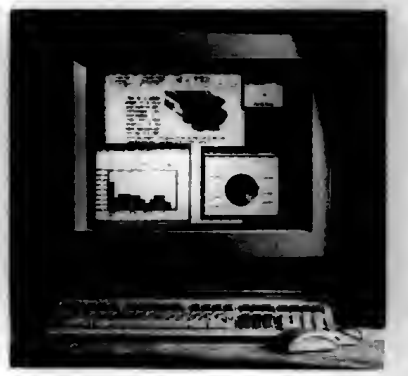

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Is there a VAX in the house?

BY SALLY CUSACK
CW STAFF

ON SITE

Fox Chase Cancer Center
Philadelphia

PHILADELPHIA — Getting a busy physician to incorporate computer use in his daily rounds is not always easy. However, by providing an easy-to-use interface on a Digital Equipment Corp. VAX — the kind one expects from an Apple Computer, Inc. Macintosh — Fox Chase Cancer Center is accelerating the use of technology by doctors and nurses.

Fox Chase is one of the largest cancer centers in the U.S., accommodating science laboratories used by Nobel laureates and an oncologic hospital dedicated to providing the most up-to-date research and treatment of all types of cancer.

According to Jack W. London, director of the medical computer facility at Fox Chase, it has only been in recent years that people have looked at ways of supporting doctors and nurses. In the past, hospital information systems generally focused on administrative tasks.

"You can't force physicians and nurses to use computers," London said. "The systems have to be useful for them. Response time is essential, as well as ease of use."

To that end, London and his staff have implemented a strategy that integrates patient management, research and billing information on one platform, which is accessible via a graphical user interface — effectively combining the old and the new.

The IS staff is maintaining a VAXcluster to run relational databases and hospital IS applications while it installs X terminals, workstations and sophisticated imaging technology.

With more than 350 end users at the facility — many of whom use DEC VT 220 terminals — the process of installing the X terminals and reduced instruction set computing workstations has been evolving slowly over two years.

"Most of the doctors were familiar with the Macintosh. The interface on the CRTs was unacceptable to them," London said.

The IS staff determined that RISC-based workstations would be cheaper than Macintoshes, and with the advent of X-terminals, the workstations would be able to offer point-and-click capabilities.

London *sought Mac touch for VAX*

London said it was the radiologists who initially pushed for all-digital Picture Archiving Communications Systems, which would integrate all computerized axial tomography (CAT) scan and magnetic resonance imaging (MRI) results in the system for easy viewing.

"The CAT scans and MRIs are all digital images to begin with, so they were fairly easy to convert into the system, but the X-rays and mammograms have to be converted over to print film and scanned into the system," which is a more time-consuming proposition, London said.

The result, however, is cutting-edge technology that can quickly deliver vital information to a physician in both textual and visual formats on the X terminals.

London said users are excited about the point-and-click environment. "Things worked out well. We started with a DECstation 3100, running Ultrix, back in 1990, and now we have about a dozen DECstation systems functioning as servers to the the X terminals," he said.

The original DECstation 3100 was replaced by a DECstation 5000, and the workstations, which function as servers to the X terminals on a local-area network, connect to the VAXcluster via Transmission Control Protocol/Internet Protocol.

The hospital will move over to Fiber Distributed Data Interface in the not too distant future, London said, to accommodate the increased network requirements from the imaging technology. Currently, a second DECstation 5000 serves as an image management workstation to capture images from a scanner.

Eventually, everyone will move to the X-terminal, RISC-based Unix environment. "We have a lot we want to do, but we're by no means there," London said.

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NEW PRODUCTS

Processors

Dataram Corp. has announced add-in memory for the Digital Equipment Corp. VAX 4000 Model 500 system.

The Dataram DR450 is available in 32M-, 64M- and 128M-byte single-slot versions.

Pricing starts at $13,400.

Dataram
Route 571
Princeton Road
West Windsor Township, N.J.
08543
(609) 799-0071

Storage

Citek, Inc. has introduced the Cyclone/36 Tape Drive.

The product for IBM System/36 mid-range systems offers storage capacities of 150M or 250M bytes on a ¼-in. DC6000 series cartridge. Average data transfer rate from disk to tape is 3.5M byte/min.

Pricing starts at $1,425.

Citek
1535 W. Orangewood Ave.
Orange, Calif. 92667
(714) 771-6199

Ten X Technology, Inc. has announced the Opti-Win 5600 12-in. write-once, read-many optical subsystem for Digital Equipment Corp. VAX users.

The drive offers 5.6G bytes of on-line storage per cartridge. According to the company, the Opti-Win unit responds to standard magnetic disk commands.

It also features a dual read/write head architecture that eliminates the need for flipping the cartridge over during operation.

The product is priced at $28,000.

Ten X Technology
Building 3, Suite 3200
4807 Spicewood Springs Road
Austin, Texas 78759
(512) 346-8360

Services

Belcastro Computer Services, Inc. has announced a service converting NCR Neat/3 code to ANSI Cobol.

Pricing is between $200 and $500 per program, depending on the Level I and Level II coding and the table handling technique employed. An output listing is produced indicating areas where the program logic must be checked manually.

Belcastro Computer Services
Suite 7
631 Vienna Ave.
Niles, Ohio 44446
(216) 652-1628

Development tools

SEEC, Inc. has announced SEEC/Care Cobol Analyst.

SEEC/Care Cobol Analyst is a Microsoft Corp. Windows-based re-engineering tool for maintaining mainframe Cobol code. It is compliant with IBM's AD/Cycle.

The product allows users to isolate the calculations that implement an application's business rules, develop an overview of program logic flow and trace the operations of a specified entity throughout the entire program.

A global Replace command allows users to replace cryptic names and references in order to increase program legibility, the company said.

The VSAM version is priced at $499. The IMS version, including VSAM, costs $699.

SEEC
5001 Baum Blvd.
Pittsburgh, Pa. 15213
(412) 682-4991

Utilities

Advanced Systems Concepts has upgraded Sequel, its data-retrieval and report-writer package for the IBM Application System/400.

Users can now update a field in one file with the contents of a field in a secondary joined file. According to the company, Sequel is the only product that provides this capability.

Pricing ranges from $4,200 to $24,000, depending on AS/400 model and the software modules selected.

Advanced Systems Concepts
Suite 310
1300 Woodfield Road
Schaumburg, Ill. 60173
(708) 605-1311

Applications packages

Dynax Resources, Inc. has upgraded its Dynax O/F financial software package for the IBM Application System/400.

Release 3.0 incorporates new General Ledger features including budget copying, a multiformat report writer and options for summarizing specified accounts.

It also offers new security options for limiting access by node, warehouse and company branch. The software now supports entries beyond the year 2000.

Pricing on rack-mounted AS/400 models is $15,000 for the General Ledger and $12,500 each for the Accounts Payable and Receivable modules.

On other AS/400 models, the price is $4,000 per module.

Dynax Resources
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Jericho, N.Y. 11753
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Client/server development tools

It's hard to tell which is more confusing — the term 'client/server' or the mix of tools intended to develop these newfangled applications

BY BOB JONES

Client/server is the Mario Cuomo of technology: It's got wide appeal, it's not very well understood, and it's complicating people's decision-making processes.

Unlike Cuomo, it looks like client/server is in the running. Next to imaging, this technology was rated the hottest by 26% of information systems professionals surveyed by Cambridge, Mass.-based CSC Index, Inc.; that's up from 7% in 1991. According to 580 high-level executives polled by the Society for Information Management, client/server is the most important technology to watch, topping electronic data interchange, optical discs and computer-aided software engineering (CASE).

Despite this popularity and the fact that client/server concepts have been around for many years, a surprising number of people still have fundamental misunderstandings of what it's all about (see chart page 74).

Making matters worse, it seems like every vendor under the sun is pitching a client/server tool these days, from CASE vendors to hardware vendors to relational database management system vendors (see stories page 75). This wide and quite varied assortment has most developers scratching their heads trying to sort out the alternatives.

It might be best to first understand what client/server is not. It does not require graphical user interfaces (GUI), object-oriented programming or even local-area networks.

Neither is client/server just personal computers sharing resources on a LAN; it's more efficient than that. On a PC LAN, when a desktop PC sends a request to the server for, say, all records with a balance of more than $1,000 within a customer file, the server returns the entire customer file across the LAN for the PC to sort through and find the records itself.

In client/server, that application would be broken into two portions so that the server could process one part of it and the client the other. In the example above, the server would determine which records fit the request before sending them over the LAN.

This reduces network traffic and decreases response time. Most important, though, it allows resources to be shared effectively. It is much more efficient to share a customer file when the entire thing doesn't have to be sent to the desktop each time a question is asked of it.

Client tools

Ironically, the glut of tools that makes purchasing so confusing is also making client/server development more cost-effective. The challenge is not knowing whether client/server is possible or cheap or even easy; it is selecting which set of tools is right for your particular needs.

The first thing to understand is that most of the available tools are intended to develop client, rather than server, applications. And while there is no fundamental requirement that client/server applications use a GUI, most of the new tools operate in a GUI environment and produce client applications that will execute under Microsoft Corp.'s Windows 3.0, Apple Computer, Inc.'s Macintosh, IBM's OS/2 Presentation Manager or Unix's X Window System environment.

Available tools are able to develop the three major portions of the client application (see chart page 74): the user interface, which consists of the screens, menus, command buttons and other objects that comprise what the user interacts with; the application logic, which describes what the client program is supposed to do with the data and resources it manages; and the server interface, which receives calls from the application logic and translates them into some sort of interprocess communications protocol.

The interface then delivers the requests to the server program, where they appear as requests to perform specific actions or "minitransactions" on behalf of the person running the client program.

The most important attributes to look for in a client development tool, then, include the following:

- **Mechanisms to easily build the user interface.** All tools that create client applications will have a portion of the tool that focuses on defining the user interface. Some tools are simple dialogue editors that produce only a basic description of the user interface for use by a resource compiler. Others are powerful, interactive screen painters. Two popular examples of the latter category are Microsoft's Visual Basic and Within Technology, Inc.'s Realizer, both of which run under Windows 3.0 and allow programmers to create Windows-based GUIs quickly.

Most tools support standard objects, such as buttons, boxes and lists. Only some will allow you to add "custom controls," which can be as simple as a

Continued on page 74

John Nelson

Jones is president of The Socrates Group, Inc., a computer-related education and consulting firm in Redmond, Wash.

INSIDE

Product Guide
Listing of GUI-based client development tools. Page 79.

Ignorance is Remiss
Questions on client/server? You're not alone. Page 85.

Buyers' Scorecard
PowerBuilder tops client/server development tools. Page 86.

Broad mix of tools

CONTINUED FROM PAGE 73

special kind of button that changes shape or color or as complex as an entire spreadsheet.

Each tool on the market also tends to support a distinct set of screen objects. Easel Corp.'s Easel, for example, allows programmers to easily create vector graphic images. Channel Computing, Inc.'s Forest & Trees enables developers to easily present database data in tabular or even graphic form.

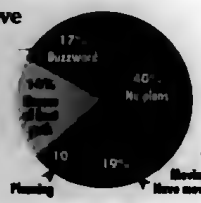
• **The "scripting language" that best fits your needs to write the application logic.** Available tools really start to distinguish themselves with their scripting language. Some languages follow a traditional procedural model and add verbs to accomplish specific user or server interface functions, while others follow a more event-driven model.

Powersoft Corp.'s PowerBuilder, Within Technology's Realizer, Borland International, Inc.'s ObjectVision and Microsoft's Visual Basic all model their scripting language on the traditional procedural language Basic, with each one supporting its own version or dialect.

Other tools such as Guidance Technologies, Inc.'s Choreographer and Micro Data Base Systems, Inc.'s Object/1 have chosen to use a more object-oriented language. Object/1 has extended the C language to make it very object-oriented, while Choreographer has created its own language, which looks like a cross between C and Pascal.

The big move

IS professionals were asked to describe their organization's attitude toward client/server computing



Percent of sites
Base: 1,606

Source: International Data Corp. CW Chart: Marie Haines

• **Built-in capabilities to communicate easily with server applications.** True client application development tools will have built-in capabilities to access server features. PowerBuilder, for example, supports full ANSI SQL and database transactions. It can associate "data windows" (a type of screen object) with a SQL query so that a single function call can update an entire window.

Choreographer and Easel not only support multiple SQL databases but also provide access to mainframe-based servers via LU6.2 Advanced Program-to-Program Communication and High-Level Language Application Program Interface.

Cooperative Solutions, Inc.'s Ellipse supports multiple servers, heterogeneous databases and two-phase commit. It automatically compiles SQL queries.

Products such as Realizer and Visual Basic have a rich set of verbs to support management of the user interface, but they don't have any built-in features to access server applications, relying instead on Dynamic Data Exchange or calls to C libraries.

Realizer and Visual Basic are better used to develop simple applications. Baxter Healthcare Corp. used Visual Basic to prototype a major application with more than 100 different screens and forms. The company was very pleased with Visual Basic as a prototyping tool and has used it quite successfully to develop some smaller applications, but it chose to reimplement its entire application using C and the Windows Software Development Kit to get the performance it needed.

Although traditional third-generation language development tools such as C or C++ yield the highest execution performance, they are only for the very strong of heart. It's difficult enough to build character-based client programs in C or C++, but writing GUI applications is another thing entirely.

Server tools

While much work has been done to ease development of client applications, writing server applications is still a brute-force technology. Some CASE products can generate server applications; however, they are typically coded in traditional languages such as Cobol, C or C++, making them difficult to develop.

At this point, most people purchase their server applications off-the-shelf in the following forms:

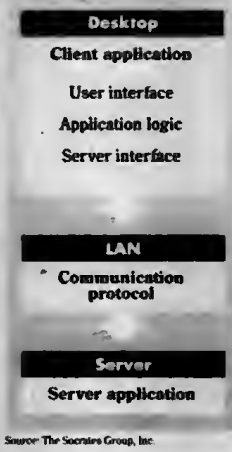
• **RDBMSs** are the most common class of server application. SQL-based RDBMSs provide services to multiple simultaneous clients, and because many of these database server vendors publish their server interface, there are many client applications and client application development tools currently available that work well with several databases.

• **Communications services** help clients communicate with other databases. Products such as Digital Communications Associates, Inc.'s Communications Server, IBM's Communication Manager and the MicroTempus Enterprise Router provide various services to support client applications connected to mainframe Systems Network Architecture networks.

• **Document management** is another server application that is getting lots of attention. Vendors such as Saros Corp., which sells the Mezzanine document management tool, publish the server interface to allow developers to build customized document management applications.

Inside view

A client/server application is actually two applications executing on two computers



Source: The Socrates Group, Inc.

What's it all about?

Keep in mind that while client/server application development tools have emerged in large numbers in the past year, many products are on Version 1.0, and no manager would want to use the first version of a product to implement a strategic, mission-critical client/server application.

However, many people are finding that the development tools and related products are sufficiently mature that they can be used to build tactical and decision-support applications.

Building client/server applications requires both selecting the right tools for your environment and growing new development skills in your staff. Carefully evaluate your needs and capabilities, and pick the tools that best match your specific environment. Then give your staff sufficient time and training to bring them up to speed. •

Shopping list

✔ Is the database server interface direct (using vendor-supplied library routines) or indirect (via routers or gateways)? Is there an extra cost for routers, and is there any performance degradation?

✔ Are there runtime licenses so that applications can be deployed inexpensively?

✔ Which platforms does the application run on? Which databases does the product support?

✔ Are there customer references?

✔ Does the product provide true GUI support (e.g., DDE, buttons or dialog boxes), or does it run as a character-based application in a GUI environment?

✔ What changes are necessary when porting an application between platforms? Are there differences in keyboards and screen design?

✔ Does the product provide transparent RDBMS access such as masking differences in SQL dialects, record-locking techniques, error messages and codes and data types?

✔ Can the front-end tool access RDBMS-specific capabilities such as remote procedure calls, stored procedures and backward/forward record fetching?

✔ Are there integrated forms and report-writer and end-user query functions?

✔ Can the tool access non-RDBMS file formats (such as dBase, ASCII, VSAM and native operating system file formats)?

RICHARD FINKLESTEIN

All development tools are not created equal

Client/server tools range from the low end — better suited for single-user desktop applications — to more complex tools for mission-critical applications that need to use shared resources.

Choosing one or the other is not an either/or decision; rather, carefully selected tools from both categories can give you a good balance of rapid and responsive development for a range of applications. Two key higher end features to look for include the following:

• **Code management.** Some tools include facilities such as configuration control and version management so that groups of programmers can share code and manage large development projects. Features such as code libraries are important to look for. Among other tools, Powersoft's PowerBuilder, Guidance Technologies' Choreographer and Cooperative Solutions' Ellipse all provide these capabilities.

Ellipse in particular goes to great lengths in its code library management, including the ability to track which versions were used to build a particular version of the application.

• Support for multiple environments. While most client development tools produce applications that execute in a single client environment, there are some that can target several platforms.

Blyth Software, Inc.'s Omnis/5 can target either Windows or the Macintosh.

GUI applications written in C or C++ can interface directly with the target GUI environment, or they can operate on an abstraction of that interface. For example, XVT Software, Inc.'s XVT and The WNDX Corp.'s WNDX are alternatives that allow C developers to create code that is easy to port between Windows, OS/2 Presentation Manager, the Macintosh, Open Look and Motif.

BOB JONES

Ease of use

Some tools are easy to learn but don't work for complex applications.

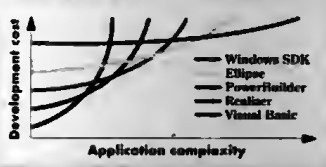


Chart is intended to show relationships and is not drawn to scale

Source: The Socrates Group, Inc CW Chart: Marie Haines

Start simple, risk little, gain much

Let's face it: Your first client/server application is not going to be perfect. So unless you were planning to update your resume, your best move is to start quietly.

For one thing, rather than implement some hotshot, to-die-for application whose failure could leave you in the lurch, choose something more on the humble side. It will give you a chance to learn about the new tools you'll be working with and uncover the strengths and weaknesses of your staff and your environment.

Second, consider building your first client/server application with an existing desktop application. Many companies are using the macro capabilities of their word processors and spreadsheets to access information from various corporate databases and present that information in the spreadsheet or word processing format itself.

Although this approach has its limitations, the applications are read-only, so there is little risk to data, and they require a minimum amount of administrative support. These applications are also resource-intensive and so are perfect candidates to take advantage of the cheap computing power available on PCs and minicomputers.

Many desktop applications have macro programming capabilities that are powerful enough for this type of programming, including Microsoft's Word for Windows, WordPerfect Corp.'s WordPerfect, Lotus Development Corp.'s 1-2-3 for Windows and Ami Pro, Microsoft's Excel, Informix's Wings and Borland International, Inc.'s Quattro Pro.

The application should be able to send and receive messages using Dynamic Data Exchange (DDE) or call routines written in C.

A programmer or even a creative power user can use DDE to send messages to an intermediate product such as Kirkland, Wash.-based SQL Soft's SQL Link, which converts the DDE messages into database function calls. Or, if the program can call C code directly, it may make function calls directly to the server interface of a SQL database server.

Executive information systems front ends — such as Channel Computing, Inc.'s Forest and Trees and Pilot Executive Software's Lightship — also allow users to quickly set up a front-end decision support environment and query a wide variety of relational and nonrelational file formats.

The major advantage of Lightship is its ability to manipulate data once it's been retrieved from the back-end database.

BOB JONES

Birds do it; bees do it

Everyone has a client/server approach, but some are stronger than others

RDBMS vendors

Most RDBMS vendors offer basic client/server application development and query/reporting tools that can be used with their own DBMS engine.

These products include Informix Software, Inc.'s Informix-4GL Forms, Oracle Corp.'s SQLforms, Sybase, Inc.'s APT-Workbench, The Ask Cos.' Ingres 4GL and 4GL/Windows and Progress Software Corp.'s Progress.

Ask and Progress offer development tools that work with other vendors' RDBMSs as well as their own, giving their tools somewhat greater portability.

The database vendor's front-end software works best when you really need a tool that is optimized to work with the specialized features incorporated in the vendor's RDBMS, including the following:

- Specialized data types, such as image and graphics fields.
- RDBMS-specific concurrency features, such as optimistic and pessimistic locking and database snapshots.
- Stored procedures and triggers, which are stored in the database server.
- Backward and forward record processing, which is needed for scrolling through multiple rows in a screen.
- Remote procedure calls.

Most customers ultimately purchase at least some of their tools from third parties to augment the capabilities of the tools coming from the RDBMS vendor.

- Additional functionality not offered by the vendor's products, such as better debugging facilities, additional support for team development, better report writers and query tools.
- Support for additional DBMSs and native operating system file structures for greater portability and connectivity.
- Support for specific client environments, such as DOS, Microsoft's Windows, OS/2 Presentation Manager or the Open Software Foundation's Motif.

Richard Finkelstein is president of Performance Computing, Inc., a database management systems consulting firm in Chicago.

CASE vendors

Vendors of CASE software are in the hot seat. Many people believe these vendors are the ones who are best positioned to bring together the many different technologies required to build a client/server environment. And it is the CASE vendors, these same people say, that can help bridge the gap between their legacy systems and the new client/server environments.

But among CASE vendors, there are widely varying degrees of support for client/server. The approaches range from simplistic grafting of a two-dimensional graphical user interface (GUI) onto essentially monolithic applications to sophisticated, object-oriented peer-to-peer applications supporting event-driven advanced GUIs.

What we will increasingly see are CASE-based structured disciplines coupled with the dynamic rapid prototyping found in object-oriented systems.

Currently, Texas Instruments, Inc.'s Information Engineering Facility provides an integrated CASE, or I-CASE, approach that generates host-oriented applications focused on application logic at the host server level.

By later this year, the company is expected to introduce an object-oriented, message-based product capable of distributing application execution across the nodes in a network. TI is also expected to better support event-driven GUIs and stored procedures.

Andersen Consulting is another I-CASE vendor successfully evolving into client/server-architected application design and generation. Foundation for Cooperative Processing currently supports event-driven GUI development and provides a message-based infrastructure to allow the GUI to invoke business logic or data services modules tied to an event.

Other major CASE vendors closely tied to IBM mainframe environments — including KnowledgeWare, Inc., Synon, Inc. and CGI Systems, Inc. — have not been as aggressive in supporting more than host-centric application partitioning, where the desktop does only presentation services.

The dark horses in the race to provide CASE-based client/server development include Cooperative Solutions, Inc. (with Ellipse), S-Cubed, Inc. (with Daisys) and Forte (with Forte). These vendors offer scaled-down development environments with no predisposition toward IBM's Repository Manager or the development of mainframe-oriented applications. These vendors will concentrate on lower CASE (application generation and management), leaving upper CASE (design and analysis) to traditional CASE vendors.

Aaron Zornes is vice president and director of applications development strategies at Meta Group, Inc., a consulting firm in Westport, Conn.

Hardware vendors

Ask your favorite hardware vendor about its client/server strategy, and you'll probably get an answer that — measured in pounds of paper — could set you up in a recycling business.

Top hardware vendors — including IBM, Digital Equipment Corp., Hewlett-Packard Co., Unisys Corp. and NCR Corp. — appear to be putting more effort into marketing hype than product availability. Sure, there are some client/server capabilities in their proprietary products, but neither IBM nor DEC can offer a robust set of tools to split a Cobol program between the workstation and the server.

It's only fair to point out that each vendor's Unix line of products is more aware of standards and more open than its proprietary environments. And it's also true that so far, the majority of client/server architectures in Fortune 500 and 1,000 firms tend to be a single-client, single-server architecture.

But users will soon want to mix and match clients and servers in a heterogeneous environment. What they need is for vendors to evolve their platforms toward the following goals:

- Make room for other hardware platforms (servers) at the back end.
- Develop a better bond with the client, or workstation, by providing tools for transparent communications.
- Provide a strong server-based RDBMS because the majority of today's client/server applications are centered around desktop tools accessing RDBMSs.
- Attract independent software vendors (ISV) and users by moving away from proprietary protocols to open protocols, including the SQL Access Group's Open SQL and X/Open Consortium Ltd.'s Distributed Transaction Processing.
- Offer a superior development environment.
- Provide tools for incorporating existing systems into client/server environments.
- Build extensible client/server infrastructures that could carry into object-oriented architectures.

How vendors are faring

Of all the hardware vendors, IBM comes up the shortest in its offerings. It has failed to provide guidance and tools for incorporating legacy systems into client/server architectures. At this point, the company has little to offer in the way of standards-based software.

On the positive side, there are a number of reputable ISVs in the IBM client/server environment, particularly Andersen Consulting's Foundation for Cooperative Processing.

DEC has more of a cultural affinity with client/server computing than IBM because of its long-standing regard for networks and scalable architecture.

Overall, the company has done a good job of opening up its platforms by offering open application programming interfaces and delivering tool kits for ISVs.

Unisys delivered proprietary client/server capabilities to its clients as far back as three years ago. Using Open OLTP, transactions can be invoked on a client machine and executed on a server machine.

HP's major contribution is NewWave, which enables users to build a client/server framework for integrating heterogeneous software. HP also has a successful relationship and some equity investment with Informix Corp. and Ask.

NCR's Cooperation is probably the most advanced and comprehensive architecture of the hardware vendors for enabling client/server applications.

NCR has also implemented a proprietary distributed transaction model called Top End and is working on an object-oriented application development environment that will extend its client/server architecture into a standards-based distributed architecture.

Natasha Krol is program director of application development strategies at Meta Group, Inc., a consulting firm in Westport, Conn.

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Stare here for 15 seconds.

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ing never before $890 terminal.

Now stare here.

Introducing the WY-325 color terminal for only $890. (Yes, you can believe your eyes.) It's ergonomically advanced. It emulates general-purpose terminals such as DEC, ADDS, TeleVideo and, who would have guessed, Wyse. And the WY-325 replaces a monochromatic terminal without making changes at the host computer or to the application. Although this list of benefits could go on, the price alone should color your thinking about terminals. If so, call your local distributor or call us at 1-800-GET WYSE.

WYSE

Don't get blown away by a DB2 data wipeout

It's only a matter of time until you'll need to recover your DB2 data, whether due to an application, hardware or DB2 failure. If you are like most users, the DB2 utility cannot recover critical data fast enough. Data unavailability means more than idle users – it can also result in lost customers and revenues.

What will you do when:

- A pack failure causes an outage of 15 hours
- Nine hours into a 10-hour recovery, the job fails, forcing you to start from the beginning
- Disaster recovery testing at a hot site cannot be completed due to lengthy recover times

Announcing RECOVER PLUS

RECOVER PLUS, from BMC Software, is the fastest recovery utility available for DB2. It recovers DB2 data two to eight times faster than the DB2 utility, helping reduce the business exposure of lengthy downtimes. A recovery that takes 16 hours using the DB2 utility can take as few as two using BMC's high-speed recover utility.

RECOVER PLUS:

- Recovers data two to eight times faster than the standard recover utility
- Offers concurrent recovery of table spaces and/or index spaces
- Reduces the steps needed to recover data
- Provides enhanced restartability options

Increase data availability

For more information on how you can recover DB2 data faster, or to begin a 30-Day-Plus Free Trial, call BMC Software at 713 240-8800 or **1 800 841-2031**.

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IBM Business Partner

GUI-based third-party development tools

VENDOR	PRODUCT	DEVELOPMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEVELOPMENT (BYTES)	DEPLOYMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEPLOYMENT (BYTES)	SUPPORTS USER-DEFINED OBJECTS	SQL DATABASES SUPPORTED	PERFORMS UPDATES ON DATA	EQUIPPED WITH MECHANISMS FOR GENERATING REPORTS	DIRECT CONNECTION/ GATEWAYS	SUPPORTS SQL DIALECTS OR SQL API	SERVER INTERFACES SUPPORTED (ASIDE FROM SQL)	SCRIPTING LANGUAGE LIKE	MULTIPLE VERSIONS OF OBJECTS	DEBUGGING FEATURES	UNIQUE ATTRIBUTES	PRICE
Ally Software, Inc. (subsidiary of Unisys Corp.) (215) 996-2049 (800) 626-8375	Ally 4GL	DOS, Unix, AIX, CTOS	4M/11M	Windows 3.0, DOS, Unix	4M/4M	No	Informix, Oracle	Yes	Yes	Direct connection	SQL dialect	Any SQL	Pascal-like	No	Execute and memorize small portions of code, debug log	Direct OLTP interface	$15,000 - $40,000, depending on number of users
Andersen Consulting (312) 507-5161 (800) 458-8851	Foundation for Cooperative Processing	OS/2	16M/120M	Windows 3.0, OS/2	8M/40M	Yes	IBM, SQL Server	No	No	Direct connection	Neither	None	NA	No	Standard debuggers	Insulates developer from having to learn native Presentation Manager or Windows or specific communications protocols	$3,500 - $6,500, depending on number of users
Asymetrix Corp. (206) 463-8501	ToolBook	Windows 3.0	4M/8M	Windows 3.0	2M/750K minimum	Yes	Any that provide Windows DLL support	Yes	Yes	Indirect	SQL API	DLL	English system	No	Step through procedure calls, display specific variables, execute and memorize small portions of code, modify code from within debugger	Flat file DBMS, hypernavigation, drawing tools, dBase III support	$395
Blyth Software, Inc. (415) 571-0222	Omna Seven Plus	Windows 3.0, Macintosh	4M/5M	Windows 3.0, Macintosh	4M/3M	No	Oracle, SQL Server, DB2, Teradata, Rdb, SQL/DS	Yes	Yes	Direct and indirect connection	SQL API	DLL	Proprietary	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and memorize small portions of code, modify code from within debugger	Cross-platform between Macintosh and Windows	$2,500
Borland International, Inc. (408) 438-8400	ObjectVision	Windows 3.0	2M/2 5M minimum	Windows 3.0, Pen Windows	1M minimum/ 3.5M minimum	Yes	SQL Server	Yes	Yes	Direct and indirect connection	Neither	Paradox, dBase, Btrieve	NA	Yes	NA	Visual programming, intelligent prompting, SQL access via add-on product	$149.95
Caseworks, Inc. (404) 399-6236	CASE.PM	OS/2	2M/2M	OS/2	Application-dependent	Yes	Any that support C interface	Yes	No	Indirect	SQL API	Any that support C interface	NA	NA	Compatible with compiler debuggers	Code generation for GUI, C or Cobol	$1,995 (C), $2,495 (Cobol)
	CASE.W Corporate Edition	Windows 3.0	2M/2M	Windows 3.0	Application-dependent	Yes	Any that support C interface	Yes	No	Indirect	SQL API	Any that support C interface	NA	NA	Compatible with compiler debuggers	Code generation for GUI, C or C++	$995
Cognos, Inc. (617) 239-0600	PowerHouse Windows	Windows 3.0, Unix, MPE-iX	2M/4M	Windows 3.0	2M/4M	No	Allbase SQL, InterBase	Yes	Yes	Direct connection	Neither	DLL	4GL	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and memorize small portions of code, modify code from within debugger	Access to mainframe data on server, world as well as network communication, built on powerful 4GL, powerhouse, single source support for terminals and PCs	$19,900 - $250,500, depending on config. version*
Cooperative Solutions, Inc. (408) 377-0330	Eliqui	OS/2	6M (client), 16M (server)/ 80M (client), 300M (server)	Windows 3.0, OS/2	6M (client), 16M (server)/ 150M (server)	Yes	SQL Server	Yes	Yes	Direct connection to LAN-based servers, indirect to mainframes	SQL dialects	DLL	Cobol	Yes	Step through procedure calls, execute and memorize small portions of code, display specific variables, modify value of variables while debugging, debug remote procedures on other machines	Client/server transaction management, active repository-based development	$9,500 per module, developer seat only
Digitalk, Inc. (310) 645-1082 (800) 922-8255	Smalltalk/V	Windows 3.0, DOS, OS/2, Macintosh	3M (Windows), 4M (OS/2), 640K (DOS), 1.5M (Macintosh)/ 3M - 6M	Windows 3.0, DOS, OS/2, Macintosh	Application-dependent	Yes	SQL Server, IBM	Yes	Yes	Indirect	SQL API	DLL	Smalltalk	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and memorize small portions of code, modify code from within debugger	Object-oriented language	$124.95 (DOS), $199.95 (Macintosh), $499.95 (Windows, OS/2)
Easel Corp. (617) 221-2100	Easel Workbench	OS/2	13M/5M	Windows 3.0, DOS, OS/2	270K - 400K/3M	Yes	IBM, Oracle, Micro Decisionware's Database Gateway, Sybase Open Server, SQL Server	Yes	No	Direct and indirect connection	Both	DDE	Event-driven, full-featured 4GL	Yes	Step through procedure calls, display specific variables, modify value of variables while debugging, modify code from within debugger	Host data access through terminals, Async Data, LU6.2, CICS OS/2 interface for cooperative processing application development, business graphics module, CASE integration	$11,900 per developer
Erlin Software Corp. (818) 549-0504	Erlin/2	Windows 3.0, OS/2	4M/5M	Windows 3.0, OS/2	4M/2M minimum	Yes	IBM, SQL Server, Oracle, Gupta	Yes	Yes	Direct and indirect connection	Both	DLL, DDE, CLI, APPC, LU6.2, EHLLAPI	Smalltalk	Yes	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and memorize small portions of code	Object-oriented programming/4GL combination	$3,000 - $7,000 includes unlimited runtime
Expertelligence, Inc. (805) 987-1797	Actus	OS/2, Unix, Macintosh, Microsoft Windows	8M/3M	OS/2, Unix, Macintosh, Microsoft Windows	6M minimum/3M	Yes	SQL Server, Itasca	Yes	Yes	Direct connection	Both	DLL, Itasca	C, Lisp, Smalltalk	Yes	Browsers, graphs, Expertools	Able to create objects, 130 classes, 4,500 methods	$395 - $3,995, depending on platform
Four Seasons Software (908) 248-0027	SuperNova	Windows 3.0, DOS, Unix, VMS	3M/5M	Windows 3.0, DOS, Unix, VMS	2M/2M	Yes	Oracle, Informix, Teradata, SQL Server, Ingres	Yes	Yes	Direct connection	SQL dialects	Flat files, C-ISAM	Proprietary 4GL	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute/memorize small pieces of code	Prototyping on flat files, distributed process	$995 - $150,000, depending on platform
Guidance Technologies, Inc. (415) 231-1300	Choreographer	Windows 3.0, OS/2	4M/4M	Windows 3.0, OS/2	250K/ 250K	Yes	IBM, SQL Server	Yes	Yes	Direct connection	Both	DLL, APPC, EHLLAPI, DDE	Pascal/C	Yes	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and memorize small portions of code, modify code from within debugger	Shared memory, team development, separate module, ability to call C and Cobol, ability to call Choreographer from C or Cobol, object-oriented language, remote spreadsheets	$7,500
Gupta Technologies, Inc. (415) 321-9500 (800) 876-3267	SQL Windows 3.0	Windows 3.0	4M/11M	Windows 3.0	2M/10M	Yes	Gupta, Oracle, DB2, SQL Server, Teradata, OS/2 Extended	Yes	Yes	Direct and indirect connection	SQL dialects	DLL, Btrieve	C	Yes	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and memorize small portions of code, modify code from within debugger	Includes stand-alone SQL engine, application generator, DBA Tool, query/reporting tool, table vendor for SQL databases	$1,995

*Includes development license and 10 runtime seats.

This chart lists tools that operate in a graphical user interface (GUI) environment and build client applications with GUI-based front ends that can make requests from multiple database servers. We did not list database-specific tools from vendors that also sell RDBMSs (see page 73 for more information on those products).

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

VENDOR	PRODUCT	DEVELOPMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEVELOPMENT (BYTES)	DEPLOYMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEPLOYMENT (BYTES)	SUPPORTS USER-DEFINED OBJECTS	SQL DATABASES SUPPORTED	PERFORMS UPDATES ON DATA	EQUIPPED WITH MECHANISMS FOR GENERATING REPORTS	DIRECT CONNECTION/ GATEWAYS	SUPPORTS SQL DIALECTS OR SQL API	SERVER INTERFACES SUPPORTED (ASIDE FROM SQL)	SCRIPTING LANGUAGE LOOKS LIKE	MULTIPLE VERSIONS OF OBJECTS	DEBUGGING FEATURES	UNIQUE ATTRIBUTES	PRICE
Intelligent Environments, Inc. (508) 640-1000	Application Manager	OS/2	6M - 8M/8M	OS/2	Applica-tion-dependent	Yes	IBM, SQL Server, Oracle	Yes	Yes	Direct and indirect connection	All extensions to the individual databases without any limitations	DLL, APPC, LU.2, CICS/OS/2, EHLLAPI	NA	No	Step through procedure calls, display specific variables, modify value of variables while debugging, list breakpoints on a procedure or expression	Automatic generation of documentation in graphical and outline form, team development support, static SQL support, point and click screen scraping for 3270/5250, English language for procedure and variable names	$7,400 for develop-ment
JYACC, Inc. (212) 307-7723	JAM family of applica-tion develop-ment tools	Windows 3.0, DOS, OS/2, Unix	550K/6M	Windows 3.0, DOS, OS/2, Unix	400K/ User-dependent	Yes	Most major databases, including Oracle, Informix, Ingres, SQL Server, DB2, Teradata	Yes	Yes	Direct connection	SQL dialects	None	C	Yes	NA	Completely portable between presentations, native window manager-driven, developers can create their own widgets, block mode support	$595 - $35,000, depending on platform
Magic Software Enterprises (714) 250-1718	Magic	DOS, OS/2, Unix, BTOS/ CTOS, VAX	640K/2.5M	DOS, OS/2, Unix, BTOS/ CTOS, VAX	640K/ 2.5M	Yes	Rdb, Informix, Oracle	Yes	Yes	Indirect	SQL dialect	Btrieve, Cuse	NA	No	Display specific variables, modify value of variables while debugging, execute and recompile small portions of code, modify code from within debugger	Code-free programming, development speed	$900 - $60,000, depending on platform
Mainsoft Corp. (415) 926-2900	ObjectView	Windows 3.0, OS/2	1M/4.5M	Windows 3.0, OS/2	1M/4M	Yes	SQL Server, Oracle, DB/2, Teradata	Yes	Yes	Direct and indirect connection	Both	DLL, C, API, Paradox, dBase, Excel	Basic, C, C++	No	NA	Table object, support for vector graphic, ad-hoc query module, produces hierarchical quality reports, access mainframe through SQL commands	$999 - $999
Meta Software Corp. (617) 576-6920	Design/OA	Windows 3.0, Unix, Macintosh	4M/4M PC, Macintosh; 8M Sun	Windows 3.0, Unix, Macintosh	1M/1M	Yes	Informix, Ingres, Non-Stop-Sequoia, Oracle, DB2	Yes	No	Indirect	Neither	None	NA	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and recompile small portions of code, modify code from within debugger	Interoperable across operating platforms, preconfigured system modeling functionality	$7,500 - $15,000, depending on platform

Just A R

VENDOR	PRODUCT	DEVELOPMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEVELOPMENT (BYTES)	DEPLOYMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEPLOYMENT (BYTES)	SUPPORTS USER-DEFINED OBJECTS	SQL DATABASES SUPPORTED	PERFORMS UPDATES ON DATA	EQUIPPED WITH MECHANISMS FOR GENERATING REPORTS	DIRECT CONNECTION/ GATEWAYS	SUPPORTS SQL DIALECTS OR SQL API	SERVER INTERFACES SUPPORTED (ASIDE FROM SQL)	SCRIPTING LANGUAGE LOOKS LIKE	MULTIPLE VERSIONS OF OBJECTS	DEBUGGING FEATURES	UNIQUE ATTRIBUTES	PRICE
Micro Data Base Systems, Inc. (MDBS) (317) 447-1122	Object/1	Windows 3.0, OS/2	4M/5M	Windows 3.0, OS/2	4M/8M	Yes	SQL Server, Oracle	Yes	Yes	Direct connection	SQL API	DLL, MDBS IV, DDE	C, C++	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code, modify code from within debugger, message tracing	Pseudo pointer, object-oriented language, incremental compiler, open API interface, source code	$995
Microsoft Corp. (206) 882-8080 (800) 426-9400	Microsoft Visual Basic	Windows 3.0	1M/4M	Windows 3.0	1M/270K	Yes	SQL Server, Ingres, Oracle, DB2	Yes	No	Indirect connection	SQL API	DLL, DDE	Basic	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code, modify code from within debugger, breakpoint	Custom controls, Windows-hosted environment, produces standard windows .EXE files	$199
HelpER Systems Corp. (415) 340-1586	Mozart	Windows 3.0, DOS	300K/500K	Windows 3.0, DOS	300K/ 500K	Yes	SQL Server, Oracle, OS/2, IBM	Yes	Yes	Direct connection	SQL API	None	4GL	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code, modify code from within debugger	Screen mapping facility	$6,000
ParcPlace Systems (415) 691-6700 (800) 759-7272	Object-works/ Smalltalk	Windows 3.0, Unix, Macintosh	4M/10M	Windows 3.0, Unix, Macintosh	Applica-tion-dependent	Yes	Oracle, SQL Server	Yes	No	Direct connection	SQL API	DLL	Smalltalk	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code, modify code from within debugger	Binary portability, Pure object-oriented	$3,500
PeopleSoft, Inc. (510) 946-9400	PeopleTools	Windows 3.0	4M/10M	Windows 3.0, DOS	4M/10M	No	SQLBase, SQL Server	Yes	Yes	Direct and indirect connection	SQL dialects	None	Basic	Yes	Step through procedure calls, display specific variables	NP	Dependent on platform

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VENDOR	PRODUCT	DEVELOPMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEVELOPMENT (BYTES)	DEPLOYMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEPLOYMENT (BYTES)	SUPPORTS USER-DEFINED OBJECTS	SQL DATABASES SUPPORTED	PERFORMS UPDATES ON DATA	EQUIPPED WITH MECHANISMS FOR GENERATING REPORTS	DIRECT CONNECTION/ GATEWAYS	SUPPORTS SQL DIALECTS OR SQL API	SERVER INTERFACES SUPPORTED (ASIDE FROM SQL)	SCRIPTING LANGUAGE LOOKS LIKE	MULTIPLE VERSIONS OF OBJECTS	DEBUGGING FEATURES	UNIQUE ATTRIBUTES	PRICE
Powersoft Corp. (617) 229-2200, (800) 395-3525	PowerBuilder	Windows 3.0	2M/20M	Windows 3.0	2M/2M	Yes	Oracle, Allbase, SQL Server, Ingres, DB2, Gupta, Xdb, Informix	Yes	Yes	Direct connection	SQL dialects	DLL, DDE	Basic	Yes	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code	Point and click SQL, custom database objects	$1,495 - $2,995, depending on platform
Revelation Technologies, Inc. (203) 973-1000 (800) 262-4747	Openingight	Windows 3.0	4M/6M	Windows 3.0	4M/6M	Yes	SQL Server, DB2	Yes	Yes	Direct and indirect connection	SQL dialects, SQL API	DLL	Basic, proprietary	No	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code	Access to multiple data sources, internal database and application engine, background processing, data dictionary, transaction processing	$895
TeleSoft (619) 457-2700	Telesse	Unix	16M/50M	Unix	8M/200K	Yes	Hooks provided to all SQL databases	Yes	Yes	Indirect	SQL API	NA	Basic	Yes	Modify code from within debugger	Dialog manager, 4GL-like scripting tool for event handling	$7,500 includes X server and Motif
Teamwarc Corp. (415) 543-8320	Primrose Workplace	OS/2	8M/60M	Windows 3.0, OS/2	4M/30M	No	SQL Server, OS/2 Extended, IBM	Yes	Yes	Direct connection	SQL dialects	APPC	Rule-based	No	Step through procedure calls, display specific variables, modify code from within debugger	Cooperative processing, desktop model	$200 - $500, depending on number of users
TGS Systems (902) 455-4446	Prograph Version 2.5	Macintosh	2M/2M	Macintosh	2M/2M	Yes	Oracle, Informix, Ingres, SQL Server	Yes	No	Direct and indirect connection	SQL API	DAL	Prograph-Visual	Yes	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and reexecute small portions of code, modify code from within debugger	Interface builder, built-in debugger, editor/interpreter, database, engine, compiler	$495

Been Printing Long

VENDOR	PRODUCT	DEVELOPMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEVELOPMENT (BYTES)	DEPLOYMENT PLATFORM	MEMORY/DISK SPACE REQUIRED FOR DEPLOYMENT (BYTES)	SUPPORTS USER-DEFINED OBJECTS	SQL DATABASES SUPPORTED	PERFORMS UPDATES ON DATA	EQUIPPED WITH MECHANISMS FOR GENERATING REPORTS	DIRECT CONNECTION/ GATEWAYS	SUPPORTS SQL DIALECTS OR SQL API	SERVER INTERFACES SUPPORTED (ASIDE FROM SQL)	SCRIPTING LANGUAGE LOOKS LIKE	MULTIPLE VERSIONS OF OBJECTS	DEBUGGING FEATURES	UNIQUE ATTRIBUTES	PRICE
Unify Corp. (916) 928-6400	Accell/SQL	Unix	4M/20M	Windows 3.0, DOS, OS/2, Unix, Macintosh	4M/20M	No	Unify 2000, SQL Server, Oracle, Informix	Yes	Yes	Direct and indirect connection	SQL dialects	RBLI, CBLI	Pascal-like	No	Step through procedure calls, display specific variables, modify value of variables while debugging, modify code from within debugger, watch points	Support of Motif, Open Look, multiple databases	$2,000 and up, depending on platform and number of users
Unisys Corp. (800) 448-1424 Ext. 173	Mapper	Windows 3.0, DOS, OS/2, Unix, 2200	4M - 8M/ 50M - 60M, depending on platform	Windows 3.0, DOS, OS/2, Unix, 2200	4M - 8M/ 50M - 60M, depending on platform	No	Oracle, Informix, SQL Server	Yes	Yes	Indirect connection	SQL dialects	DLL	C, Cobol	Yes	Step through procedure calls, display specific variables, execute and nonexecute small portions of code	Ad-hoc query, information networking	$995 - $635,545, depending on platform
Viewpoint Systems (415) 878-1501	Flashpoint	Windows 3.0	2M/4M	Windows 3.0	2M/2.5M	No	SQL Server, Gupta	Yes	Yes	Direct connection	Both	DLL	REXX	Yes	Display specific variables, execute and nonexecute small portions of code, runtime simulation	Direct support of 3270, 5250, VT100 data streams	$2,500 developer's copy
The Whitewater Group, Inc. (708) 328-3800	Actor Professional 4.0	Windows 3.0	2M/4.5M	Windows 3.0	2M/450M	NP	Paradox, dBase, DB2, Oracle, SQL Server, OS/2 Extended	Yes	No	Direct connection	ANSI SQL, Direct IV SQL	DLL	Proprietary, outline format	No	Display specific variables, modify value of variables while debugging, execute and nonexecute small portions of code, modify code from within debugger, application execution from within debugger	Full object-oriented information programming language	$495
Within Technologies, Inc. (609) 273-6881	Realizer	Windows 3.0	1.25M/2M	Windows 3.0	640K/ 500K minimum	Yes	SQLBase, Gupta, Quad Base	Yes	Yes	Direct and indirect connection	SQL API	DLL, QSE	Basic	NA	Step through procedure calls, display specific variables, modify value of variables while debugging, execute and nonexecute small portions of code, modify code from within debugger	Programmable applications tool	$395

er Than Any Other

Not just paint on a '57 Buick

BY DAVID J. RUBIN

Terry Smith was not thrilled when he realized he'd have to move to client/server. But he knew it was the only way he was going to curtail the mainframe-based development and maintenance backlog at Moog Automotive's central computing location and 35 nationwide distribution centers without spending a fortune.

"I'm not in love with PCs," says Smith, vice president of MIS at the St. Louis-based Fortune 500 manufacturer and distributor of aftermarket automobile parts. "They're difficult to control, debugging tools for LANs are difficult, and the bandwidth required for those bursty transmissions is costly to acquire."

Moog's Smith *was left cold by many front-end development tools*

In 1986, Smith realized that his company's IBM 3083J mainframe was inadequate to support a mushrooming backlog.

Moog had already distributed some applications between the mainframe and the company's IBM System/36 and Application System/400 midrange computers. But the midrange computers were too costly to install at each of the distribution centers and were painfully slow for developing applications.

Smith sought out every mainframe option, including full life-cycle CASE, only to find that the cost was just too great.

Search for Mr. Right

It wasn't until the summer of 1990 that Smith started a serious search for the right tool that would develop applications to run on a personal computer local-area network, which he'd decided would consist of 386-based PCs and a server from San Jose, Calif.-based Parallan Computer, Inc.

And Smith was one tough customer. He was left cold by front-end development tools that didn't change the way computing is handled on the back end.

Screen painters such as Easel Corp.'s Easel "made things look pretty, but it didn't change the locus of the computing," Smith says. "It's like nice gift-wrapping on a present, but what's inside is still the old application. I've got better things to do than put a new paint job on a '57 Buick."

Smith realized he'd need a tool with powerful back-end capabilities, including code generation, a powerful central repository and two-phase commit. He eventually chose Ellipse from San Jose-based Cooperative Solutions, Inc.

Ellipse has allowed Moog to move some pretty powerful applications to the client/server environment. First came a warranty-tracking system for automobile air-conditioning unit repairs and then a program to track product sales through various distribution channels.

The mainframe still plays a role in the setup. All the processing will eventually be moved to the client/server system, but the data will be passed to the accounts receivable application on the mainframe.

Despite his reluctance to move to the PC LAN environment, Smith can't help but be pleased with the results. Development projects now take one week, compared with 120 days in the midrange environment, and deployment costs are reduced.

Still, Smith says, "If someone had come up with a $65,000 product that worked the same way on a mainframe, and it didn't require any more MIPS, I'd probably be using that. But [PC LANs] is the platform that has the solution, and that's why we're with it right now." ●

Rubin is a free-lance writer in Arlington, Mass.

Full life cycle support

Jim Pollard, director of information services at Florida Power Corp. in St. Petersburg, Fla., had high-end needs. But unlike Moog's Terry Smith, he chose to go with a full life-cycle CASE tool, Andersen Consulting's Foundation for Cooperative Processing (FCP).

Like Smith, Pollard was struggling with an older environment — a Hitachi Data Systems Corp. XL100 mainframe, 21 MicroVAXes, 3 VAXclusters and scores of 3270-type terminals. Florida Power needed a system that could help service reps offer an immediate response to customers who called with a power emergency.

Pollard decided the best solution would be to put PCs on the reps' desktops and give them access to applications such as load management, energy control, service dispatch and central accounting.

That way, the reps would not only have customer information at their fingertips but also be able analyze data and perform what-if scenarios while the customer was on the phone.

To build those applications, Pollard knew he wanted a tool that could go the distance from application design to execution. He wanted a robust central data repository, rapid execution powers and the ability to generate applications for multiple client platforms.

FCP was the most attractive option to him, Pollard says, because he needed the ongoing support to integrate computing platforms.

DAVID J. RUBIN

Laser Maker.

What you always wanted to know about client/server but were afraid to ask

The grade-school rule still applies: No question is a dumb question. That's especially true when it comes to client/server, a topic that for most people raises the most basic question of all: What is it? So without asking you to raise your hand, we've provided answers to some of the most commonly asked questions on client/server.

How difficult is it to get started using client/server?
No beating around the bush here — it's difficult. Especially with the first couple of applications you bring up, there will be bugs to work through and a collection of little nuisances that crop up. The best advice is to take small manageable applications and allow yourself time to get through the learning curve.

How "open" is client/server computing? Will I end up with integration problems?
Client/server is about as open as Unix, which has its own variety of flavors. So it is *possible* to integrate the different standards versions, and in fact it's better to start getting experience in client/server now than to wait until everything is 100% open.

How much control should be given to the end user?
Desktop users should be able to do ad hoc query and report generation, but don't give them access to critical data such as management or security information.

It's a good idea to just ask the users what they want and be flexible about giving it to them.

How do you manage client/server?
There aren't too many management tools available, although some are emerging. Right now, it's really important to have a knowledgeable staff that understands the nitty-gritty detail of the operating system and the networking environment.

What management tools are available?
Generally, while you can measure the performance of the networking entities, you can't measure the system entities and storage facilities. Vendors such as HP and Legent offer piecemeal approaches, but there is nothing for complete correlation.

Is client/server going to give me productivity benefits?
The technology isn't available yet to give you a whopping amount of productivity. In a year from now, things will be much different. You will see a lot more workgroup applications, multimedia and humanlike interfaces that will increase productivity.

What are the different ways of getting improved performance in a client/server environment? Which is best?
"Best" depends on where the bottleneck is, which can be determined by simulation, modeling and measurement tests. Solutions include using either a faster server machine, a faster client machine, a faster network, multiple servers, a split database or a replicated database; using stored procedures; changing communications protocols; and moving some processing to the client computer.

What are "stored procedures," and why are they important?
Stored procedures are programs stored and executed on the server (rather than the client) machine. They are typically used to improve performance in database server configurations. Currently, the only stored procedures available commercially are from Sybase/Microsoft, but others will arrive in '92.

I've heard people mention "authentication servers." What are they?
An authentication server is a separate server that implements security in a distributed environment. They'll increase in popularity as programs and data are distributed to multiple computers.

Will the client/server application be able to work with the rest of my system?
It should! In fact, you should get a contract from the vendor assuring you that the systems will be able to work together. If its system can't perform a certain task now, don't accept the promise of six months from now.

What's the biggest obstacle that a development team must overcome?
Without question, the main issue is the lack of robust interoperability among vendors' front-end development tools and back-end databases. There is a huge difference between demos, building pilot applications and developing mission-critical systems. Inordinate amounts of time and effort go into developing workarounds to problems of incompatibility and inconsistency among different vendors' tools.

The following consultants provided the above questions and answers: Frank Drubeck, Communications Network Architects, Inc., Washington, D.C.; Jerry Grochow, vice president of Corporate Technology, American Management Systems, Inc., Arlington, Va.; Jeff Tash, president, Database Decisions, Inc., Newton, Mass.; and Walter Ulrich, Arthur D. Little, Inc., Los Angeles, Calif.

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BUYERS' SCORECARD

PowerBuilder, Uniface lead client/server poll

BY DEREK SLATER
CW STAFF

Keeping up with the products in the hot client/server applications development tool market is a daunting task: New packages are appearing at a dizzying rate.

Among those taking an early lead in installed base — Revelation Technologies, Inc.'s Advanced Revelation; DataEase International, Inc.'s DataEase; Powersoft Corp.'s PowerBuilder; Gupta Technologies, Inc.'s SQL Windows; and Uniface, Inc.'s Uniface — the PowerBuilder tool kit ranked highest in the *Computerworld* Buyers' Scorecard on client/server application development tools.

Grades from PowerBuilder's users produced an overall score of 78, two points ahead of the nearest contender, Uniface. The product received top scores in five of the 15 feature/function categories, with noteworthy margins in speed of applications development and responsiveness of vendor service.

Silver medalist Uniface distinguished itself in handling true client/server architecture functions. The product's users gave it winning scores in five areas, including support for multiple server databases (9.2, compared with second-place PowerBuilder's 8.0), support for multiple front ends (8.0 to SQL Windows' 6.7) and support for communciations protocols between client and server (7.7 to PowerBuilder's 7.6).

Despite the newness of the technology, users registered relatively high satisfaction with all the products surveyed. The mean score overall was 74 out of a possible 100.

Users rated only the product they currently use, giving it a 1-to-10 score in each of the 15 categories. They also rated the importance of each area. Overall scores were determined by multiplying the mean rating each user group gave its product by the mean importance factor assigned to each criterion by all respondents. Scores were then converted to base 100. The response base for the survey was 30 users for Uniface and Advanced Revelation, 42 for PowerBuilder, 44 for SQL Windows and 50 for DataEase.

Total possible score	100
Mean score	74

Among the remaining products, Advanced Revelation scored well in most of the areas users said were of greatest importance.

Revelation Technologies' product earned the top score in four of the eight most important categories and achieved its highest score in the prime area of quality of applications produced (8.7).

SQL Windows placed between second and fourth in most categories.

True to its name, DataEase earned its highest score in ease of use (8.3), running a close second to PowerBuilder in that category and in training time required.

Support for Microsoft Corp.'s Windows as a front end emerged as one of the key issues. Currently, only PowerBuilder and SQL Windows build Windows-specific front-end applications; their users registered a high level of satisfaction (8.7 for PowerBuilder and 8.3 for SQL Windows). •

COMPUTERWORLD BUYERS' SCORECARD

Client/Server applications development tools

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Uniface, 30; PowerBuilder, 42; SQL Windows, 44; Advanced Revelation, 30; DataEase, 50.

Product	Highest ratings	Lowest ratings
Powersoft's PowerBuilder SCORE 78	Quality of applications Ease of use Speed of applications development	Support for multiple front ends Amount of memory required Support for dividing processing tasks
Uniface's Uniface SCORE 76	Support for multiple server databases Quality of applications Support for multiple front ends	Training time required Amount of memory required Quality of technical support
Revelation Technologies' Advanced Revelation SCORE 74	Quality of applications Value for the dollar Integration of functions	Support for multiple front ends Training time required Support for client/server communications protocols
Gupta's SQL Windows SCORE 74	Quality of applications Value for the dollar Ease of use	Responsiveness of vendor service Support for multiple front ends Quality of technical support
DataEase's DataEase SCORE 70	Ease of use Speed of applications development Quality of applications	Quality of technical support Support for multiple front ends Responsiveness of vendor service

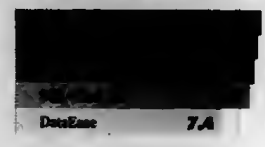
KEY RATINGS

Advanced Revelation and PowerBuilder dominate the six key categories, with PowerBuilder chalking up four first-place ratings. Advanced Revelation tops the most important area — quality of applications produced — and also scores a narrow first in strength of programming language.

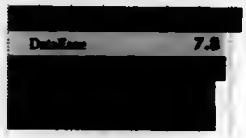
User importance rating

(Detailed ratings on next page)

9.1 Quality of applications produced

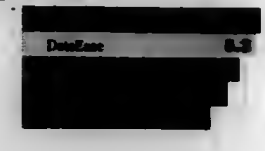


8.4 Speed of applications development



8.4 Quality of technical support

8.4 Ease of use



8.3 Strength of programming language

8.2 Responsiveness of vendor service

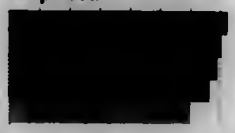
A CLOSER LOOK

Client/Server applications development tools (continued from previous page):

Highest rated PowerBuilder tops training category while second-place Uniface take first in five of nine categories.

7.9 Value for the dollar

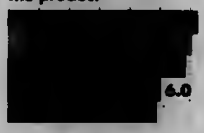
7.8 Integration of functions within the product



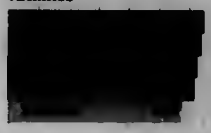
7.5 Support for multiple server databases

7.3 Support for client/server communications protocols

7.3 Training time required to use the product



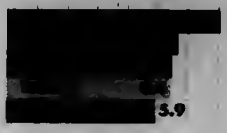
7.2 Quality of code generation facilities



7.2 Support for dividing processing tasks between client and server

6.7 Amount of memory required

6.6 Support for multiple front ends



Verbatim

What do you like best/least about this product? (Responses are based on most frequently stated answer)

	Likes	Dislikes
	Quality and ease of applications development Intelligent use of Windows Versatility	Poor report capabilities Lacks versatility Poor technical support
	Versatility Robust programming language Speed of product development	Difficult to use Poor technical support Lacks versatility
	Quality and ease of applications development Versatility Robust programming language	Difficult to use Slow Lacks versatility
	User-friendly Versatility Quality and ease of applications development	Lacks versatility Poor technical support Programs are limited in features
DataEase	Quality and ease of applications development User-friendly Versatility	Inadequate language ability Poor technical support Programs are limited in features

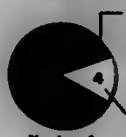
Loyalties

Would you buy the product again? (Reasons are based on most frequently stated responses)

PowerBuilder — Response base: 42

Uniface — Response base: 30

Advanced Revelation — Response base: 30



SQL Windows — Response base: 44

DataEase — Response base: 50

Vital statistics

Total number of respondents: 195

What is your position?

Manager	77
Applications development manager	63
Staff	56

For which platforms are you developing client interfaces?

DOS-based PC	110
Windows-based PC	64
OS/2-based PC	8
Unix workstations	5
Other	8
Don't know	1

What is your responsibility for client/server applications development tools?

Determine need	178
Buy for end-user departments	113
Evaluate or recommend vendors	11

For how many years have you been using this product?

4 years or more	26
3 years	18
2 years	32
7 months - 1 year	69
0 - 6 months	51

METHODOLOGY

To qualify for this Buyers' Scorecard, a product must be one of the market share leaders among client/server applications development tools, and it must support multiple databases.

User names were provided by a combination of vendor and nonvendor sources. The response base was 42 for PowerBuilder, 30 for Uniface, 30 for Advanced Revelation, 44 for SQL Windows and 50 for DataEase. First Market Research in Austin, Texas, conducted the telephone survey and tabulated the results.

The total weighted scores were computed by multiplying the mean importance scores users assigned all criteria by the mean score each user group gave its own product.

Ratings are presented in order of importance based on these mean importance ratings.

Respondents cited the following reasons for their use of client/server applications development tools: quicker and easier applications development, improved productivity, greater flexibility and unified database control.

Most frequently named improvements users said they would like to see in future product releases were enhanced report writing capabilities and greater Microsoft Corp. Windows integration.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance in preparing this Buyers' Scorecard: Computer Intelligence; Neil Hill, Forrester Research, Inc.; Richard Finkelstein, Performance Computing, Inc.; Peter Kastner, Aberdeen Group; International Data Corp.

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A national network that isn't

Businesses may not get the full benefits of wide-area networking over a national backbone unless planning gets straightened out

BY GORDON COOK

Picture the possibilities. A national computer data network stretching from coast to coast; a multigigabit resource that your company might eventually use for videoconferencing, telecommuting, telephone and workstation integration, Integrated Services Digital Network, image communications, multidocument storage and retrieval, multimedia communications and so on.

Now imagine that picture in shambles.

This idea of a powerful national network for finding, manipulating and disseminating information may never be realized because of poor planning.

The primary obstacle to this vision of a national, commercialized network is that it has been overlaid on a preexisting plan to create a national research and education network, an infrastructure that may not be elastic enough to accommodate the very different needs of three very different groups: commercial users, academic users — including higher education and kindergarten through grade 12 — and the general public. If the interests of these diverse groups are not adequately sorted out and reconciled, no one will win.

Politically, an unclear policy about whom the network serves has pitted the three classes of users against one another, with the entity that manages the current network apparently unable to reconcile them. Logistically, issues of cost, security, access and control have yet to be made clear.

The original vision for a National Research and Education Network (NREN), proposed in 1987 by the Office of Science and Technology Policy, was to increase the backbone speed of the nation's academic computer networks, known collectively as the American Internet, from 56K bit/sec. to more than 1G bit/sec. by 1996.

Picking up speed

The NREN backbone would go from T1 (1.55M bit/sec.) in 1988 to T3 (45M bit/sec.) by the end of 1992 and then finally to multigigabit speed by the mid-'90s. The gigabit backbone would be able to carry ASCII text of the entire Encyclopedia Britannica from coast to coast in seconds.

Under the auspices of the National Science Foundation (NSF), the NREN was supposed to combine the networks of NASA (NSInet), the Department of Energy (ESnet), the NSF (NSFnet) and the Defense Data Network (MILnet). While it is expected that all the networks will be attached to the backbone eventually, today's plans focus primarily on NSFnet.

The NSF awarded a cooperative agreement in 1987 to the Michigan Education and Research Infrastructure Triad (Merit) to install and manage the T1 backbone that is to become NREN. Merit included IBM and MCI Communications Corp. as "joint study partners" in the venture, and it is on MCI's national network that the backbone is based. IBM and MCI spun off Advanced Network and Services (ANS) in September 1990 to manage the network for Merit.

NSFnet is composed of leased lines sending data to 1 million commercial, academic and research users of 32 midlevel networks connected to the MCI backbone at 16 end nodes. ANS controls the point of interconnection to NSFnet for all 32 midlevel networks, which in turn connect approximately 1,200 businesses, universities, colleges and government laboratories engaged in research and education.

Data traffic over NSFnet has increased from roughly 100 million packets per month in the summer of 1988 to a current total of about 9 billion packets per month.

Because only academic traffic is allowed over NSFnet, ANS has also been allowed to run another virtual, independent network over the same physical equipment. While NSFnet is for those colleges and universities that receive government subsidies to connect, ANSnet is for those organizations such as Abbott Laboratories and Union Carbide Corp. that purchase direct attachments from ANS.

These organizations are capable of using their ANS

Continued on page 92

Linda Bleck

Cook recently completed an appointment at the U.S. Congress' Office of Technology Assessment (OTA), where he directed an assessment of the proposed National Research and Education Network. He is currently president of Cook Network Consultants (cook@tmn.com) in Ewing, N.J. The opinions expressed here are those of the author and do not reflect those of the OTA.

- **The conflict of three user bases**
- **IBM, MCI's stake in the network**
- **Same goal, different motivation: Gore, Kapor**

Continued from page 91

attachment for intracompany transactions having nothing to do with the academic community — actions that are barred from the government-sponsored backbone.

Vendor companies can use their attachment for commercial purposes, such as selling products and services to the research and education community.

Sense of purpose

When it was conceived, the national network was touted as enabling a startling variety of "information age" applications for academic and research users only. It would make possible the transfer of electronic mail and data files in multimedia formats, including high-resolution graphics, full-motion video and sound. It would also offer multimedia computer conferencing capabilities.

Furthermore, the network would include knowledge-management systems to provide standard, consistent and intuitive interfaces to network services and resources. Users would navigate through vast seas of information by means of intelligent programs called "knowbots" (knowledge robots) that they could send through the network in search of specified information.

But even as this plan for academic computing was proceeding, the potential of using NSFnet's wide-area networking technology — primarily Transmission Control Protocol/Internet Protocol (TCP/IP) — was not lost on information systems managers in Fortune-class companies. With TCP/IP, they envisioned connecting corporate local-area networks situated over a large area into enterprise networks. Furthermore, once the "sizzle" applications became viable on the network, business users would have access to those, too.

Advocates of the NREN include the NSF, Congress — most notably Sen. Albert Gore (D-Tenn.) — academic computing organizations and government agencies such as NASA and the Defense Advanced Research Projects Agency (DARPA).

These advocates lobbied to up the speed and reliability of the network to make it attractive to commercial users. Commercializing and privatizing the network would in turn help academic users, the thinking went, because if businesses signed on to the network in large numbers, academic use of the network could be subsidized in part by profits from commercial use. (However, it's too early to tell whether this strategy is working.)

At the same time, librarians, primary and secondary school educators and representatives of grass-roots networks used for technical, scientific and hobbyist discussions declared their stake in the NREN. Their concern, like that of their brethren in higher education, was that the network not be built in such a way that costs of use would rise too high for them to be able to afford to access it.

Unfortunately, the needs and interests of these communities are not always in sync (see chart above), and neither ANS nor the NSF nor Congress has proposed a way to plan and coordinate peaceful coexistence between the reliable, high-bandwidth, production-quality network needs of commercial users and low-cost, easy access needs of academic users.

At cross purposes

A national network is attractive to both business and academic users, but each group has different needs

Commercial	Higher education	Individuals; K-12
Reliability more important than cost	Some compromise in reliability acceptable to keep costs low	Same as higher education
High bandwidth	High bandwidth	Current bandwidth OK
Data proprietary so security critical	Data sharing important so security not critical	Data sharing important so security not critical
Government help with training and documentation not expected	Uncertain goal: More network users via better training or much faster bandwidth at expense of more users	Better documentation and training needed

Conflict of interest

While all groups are interested in user-friendly interfaces and other common services, such as network address directories, other needs of the three communities conflict. For example, the business community is unlikely to want to pay for the multimedia database access the academic community desires, and the academic community might be reluctant to pay for the security and reliability advances needed to make the network fit for the corporate world.

The conflict is also one of philosophy. Overlapping an academic network onto a network suited for corporate use is fundamentally contradictory in that the groups handle information in very different ways. The academic and research community will use the computer network to share information. Within this community, the network benefits research and education in direct proportion to the extent to which it enables sharing of information across institutional boundaries.

The corporate world's data is generally proprietary. While data does need to be shared within a corporation in controlled ways, management must guard at all costs against leakage of proprietary data to the outside.

Although there have been no recent security problems on the order of the Morris worm in 1988, network managers at companies such as Apple Computer, Inc. have declared that they would not use NSFnet for enterprise networking because they feel it is not sufficiently secure. The installation of intricate security procedures could likely render the network secure enough so that commercial users could use it without fear of breaches. ANS is working on providing special security packages for such users.

However, these security measures may likely be complicated and counterproductive for academics.

Some observers say usage-based pricing is necessary to add cutting-edge applications to the network. Unfortunately, the existing culture of network use has become firmly rooted in fixed-cost charges to an institution for a fixed amount of network bandwidth (speed). Actual use of the network by individuals is unmetered and uncharged for. Installing individual, usage-based charging capability would require a major, and presumably expensive, software development effort (routing tables and protocols) on the part of users.

In terms of reliability, corporate users would need the services of full-time experienced professionals on the staffs of their network services providers. Should the network fail for any reason, commercial Fortune 1,000 IS managers will be much less forgiving than professors, whose use tends to be less time-sensitive.

Continued on page 94

IBM, MCI: Networking toward a competitive edge

The fact that IBM and MCI are corporate sponsors of ANS has sparked debate over whether these corporations have some advantage over their competitors when it comes to using the network to test and develop their products.

IBM, for its part, appears to be investing in the network as a major strategy to revive parts of its business.

In its partnership with MCI and Merit, IBM has a center-ring seat in the development of the world's largest test bed for the development of TCP/IP internetworking. Without its participation in the NSFnet's T1 backbone, observers claim, IBM wouldn't have learned how to incorporate TCP/IP into the networking of its mainframes. Failure to do this would have isolated IBM's mainframes and could have endangered the company's survival.

Beyond TCP/IP, IBM's success in the networking arena has hinged on its development of a network switch. IBM, long known for its interest in proprietary protocols, embraced TCP/IP as an open standard at the network (3) and transport (4) layers of the Open Systems Interconnect seven-layer network stack. TCP/IP could ride on several options at Level 2, the data link layer.

The telephony community, for its part, developed an international standard known as asynchronous transfer mode that would deal with fixed-length packets for use over the Synchronous Optical Network at speeds up to multiple gigabits in fiber-optic transmission. IBM's switch, known as Paris, would use packetized transfer mode (variable-length packets) over Sonet.

The stakes with Paris appear to be large. If the switch were to become extremely successful in the provisioning of high-speed networks, it could hinder the ability of the regional Bell operating companies to offer their own planned high-speed data service, known as Switched Multimegabit Data Service (SMDS) — a service dependent on asynchronous transfer mode-capable switching.

SMDS will give single PCs and entire LANs the opportunity to plug into metropolitan-area networks with data transport rates in 64K bit/sec. increments, up to a total of 45M bit/sec. SMDS can carry TCP/IP and would provide a means to deploy NREN services as part of the public switched telephone network.

IBM agreed to add asynchronous transfer mode capability to Paris by the summer of 1991, with an asynchronous transfer mode "interface" available by late 1991. The switch would remain a packetized transfer mode-based device and would gain the capability to encapsulate asynchronous transfer mode cells inside the much larger packetized transfer mode packets.

In early 1991, IBM announced a three-year study of its Paris technology with Bell South Services, Inc. In October 1991, it signed an agreement with Rogers Cable TV Ltd. to use Paris to better define the technologies needed to support interactive multimedia applications.

IBM has yet to deliver. The timetable for the addition of asynchronous transfer mode as an interface to Paris is not clear. Paris' commercial release is anticipated for 1993 or 1994.

MCI eyes T3

With its participation in the backbone, MCI has gained a cooperative test bed in which to develop the first nationwide TCP/IP LAN interconnect T3 backbone in which single application bandwidth can vary in size all the way up to, and including, 45M bit/sec. With its work, MCI may be able to develop and market certain data services before AT&T and the regional Bell operating companies are able to do so.

The NSFnet environment fits MCI's strategy of bandwidth on demand — the ability for users to call up and tear down bandwidth instantaneously in increments of 64K bit/sec.

The strategy, MCI says, is for a platform for frame relay today and SMDS, asynchronous transfer mode and broadband Integrated Services Digital Network in the future.

As of December 1991, MCI is the only carrier to offer switched (on-demand) T3 service. The rate is $127 per minute, prime time.

MCI is tailoring its services on a worldwide basis and is pushing intelligence down into the network, something that should be useful if the research network ever begins a program of billing on a usage basis.

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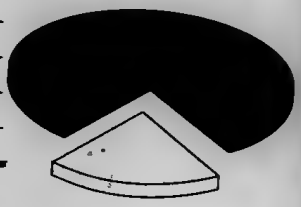

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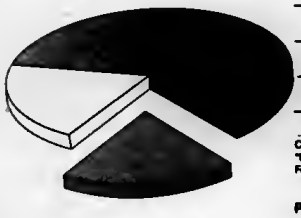

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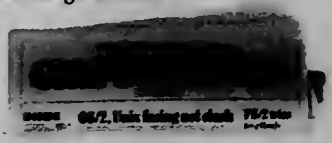

The Newspaper of IS

Continued from page 92

Of further concern for all network users is the maneuverings surrounding ANS' stake in the network. Other companies, namely Performance Systems International, Inc. in Reston, Va., and Uunet Technologies, Inc. in Falls Church, Va., have joined in the fray to compete with ANS in interlinking people directly with NSFnet. Performance Systems and Uunet formed the Commercial Internet Exchange (CIX), interconnecting their T1 national networks in California and agreeing to exchange data packets among all members.

ANS released a plan in August 1991 for charging the midlevel networks and the CIX for interconnection to its backbone. For companies using CIX or these midlevels to go through the backbone to get to WAN sites, this will mean higher costs. Academic users would feel the crunch as well.

More disconcerting is that if some of the midlevels cannot afford the interconnection fees and go out of business, users will have to do without while they scramble for other means to connect.

Making the connection

There seems to be some question of whether connection through ANS to the backbone means full connection. In December, ANS placed filters on network routers so that traffic from its commercial customers would not reach those midlevels that had not signed ANS connectivity agreements. What this did, in effect, was shut off a portion of the academic network to ANS commercial customers.

Having thought it had purchased access to the entire network, one corporate user, Dialog Information Services, was dismayed to find that it had access to only about 25% of the network because three-fourths of the midlevels refused to sign ANS connectivity agreements.

The NSF is planning to rebid the backbone in November, which may help quell accusations of monopolistic practices that could hurt customers. Furthermore, there will be a hearing this week (March 12) by the House Subcommittee on Science Research and Technology to sort out and discuss the management and control of the NSFnet.

In the end, if such network politics,

Votes of support

Sen. Albert Gore (D-Tenn.) and Lotus Development Corp. founder Mitchell Kapor are big proponents of a national network, albeit for different reasons.

Gore, who introduced the legislation in Congress to create a national network, sees it as a way to increase U.S. competitiveness.

Kapor, who helped found the Electronic Frontier Foundation, a watchdog group that tracks public policy on communications media, says he sees the network as a way to express the values of openness, freedom and idea exchange.

Here's what each had to say:

Gore: "Japan has announced plans to connect every factory and home to a high-volume network during the next two decades, estimating that when it is complete, as much as one-third of Japan's gross national product will come from new goods and services made possible by the network. . . .

"The U.S. still has a large lead in this area, but if we don't act to exploit that lead, it will disappear. . . . that's where the [national] network comes in. . . .

"Our challenge is to process data into information, refine information into knowledge, extract from knowledge understanding and then let understanding ferment into wisdom. Supercomputers, digital libraries and a national information superhighway are critical if we are to begin to meet that challenge." [CW, Sept. 3, 1990].

Kapor: "One positive implication [of a national network] is that companies can use it as a resource to connect their sites as an alternative to a private network. But also, it is a marketplace, a way for people to conduct electronic commerce, to deliver services. It's a base for free software and increasing amounts of commercial software.

"But there are concerns about security. Those are not unfounded. There aren't many companies on the network. Apple, Sun, Next have significant presences, but they all have fire walls up. . . .

"That's not hard to to do. But many people don't know how to do it. . . . So it's easier for a vice president of IS in some big corporation to say, 'We're not going to touch this stuff 'til they straighten all that out.' " [CW, Dec. 9, 1991].

Kapor co-authored an article, "The NREN as a test bed for the national public network," published in Building Information Infrastructure *(McGraw-Hill, Inc., 1992)*

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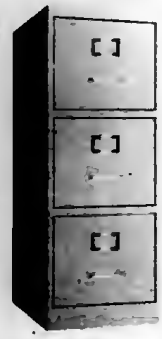

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planning and priorities are not straightened out, the entire nation stands to lose, not only because NREN promises great speed and technical potential but also because the network that exists today has been a very productive data networking technology research and development proving ground. The network offers an environment nearly the equivalent of Bell Laboratories or Bell Communications Research, Inc. facilities for wide-area networking. It can and has been functioning as an open and powerful test bed for the development of new communications technologies.

Protocols born

Technologies, most significantly TCP/IP, have been spawned on the network, as have other new communications protocols and the associated computers and programs necessary to exploit them, such as the Simple Mail Transfer Protocol used in commercial products.

Furthermore, the network's future may have a bearing on current research in the area of distributed supercomputing, in which multiple supercomputers linked across a WAN exchange data in real time. NSF- and DARPA-funded gigabit test beds are experimenting with clear-channel gigabit speed, which gives a single network user a bandwidth of 622M bit/sec. or more to work with.

The network has also been a seedbed for the start-up of many commercial companies. Wellfleet Communications, Inc., Cisco Systems, Inc. and Proteon, Inc. have all emerged in the last six years from work done on the network.

Straightening things out

Overlaying new and more powerful academic tools on a network that is also trying to serve the needs of corporate users doesn't seem to be working. What can be done? The following might help smooth things out:

- Congress must decide the degree of oversight to extend to the network. Such oversight could range from legislating that the Federal Communications Commission regulate the network to strict reviews of the NSF's actions as they pertain to ANS to vesting oversight powers in an independent oversight and planning agency for the network — a corporation for public broadcasting, if you will. This entity would bring together the complete range of stakeholders in the national network.

For example, a corporation for public networking could have governors, nominated by the members of the network community and subject to the approval of Congress. Each governor would represent a network constituency, including corporate users, education and research users, personal computer users, vendors and so on. These govenors would ensure that the needs of their constituencies were addressed and problems resolved.

- Congress must decide whether the appropriate place to subsidize technology transfer is within a privatized, operational NREN or within the experimental gigabit test beds. Without a better understanding of how the technologies are evolving in the commercial marketplace and of the evolution of both the test beds and the NREN, it will be difficult to make a wise decision.
- Congress must decide whether to subsidize the backbone for an NREN. If it does subsidize such a backbone, it must decide whether it will be built as a private network or as a part of the public switched telephone network.

In the absence of a well-thought-out plan agreed to by all parties, the grand push to accelerate both the speed and the scope of the technology could have the ironic role of weakening the entire foundation of the network. Until Congress provides more direction, the squabbling that has developed is likely to continue.

In the absence of such direction, at best, large sums of public funds may be ineffectively spent; at worst, a picture of empire building could emerge.

Such an outcome should be avoided because the potential of a well-designed and well-developed network to do great good for commercial companies in technology transfer and enabling improved research and education is very significant. •

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EXECUTIVE TRACK

Irving Pollack has been promoted to senior vice president and manager of information systems and organization at **Credit Lyonnais, U.S. Branches** in New York.

Pollack, 53, is responsible for all of the French banking giant's technology in the U.S. branches, including data processing, trading room technologies and voice and data communications. He had been first vice president in charge of IS and organization since 1987.

Pollack joined Credit Lyonnais in 1975 as an assistant vice president and manager of data processing. Before that, he worked for CARE, Inc. in New York for 15 years, the last 11 as director of programming and systems.

Edward N. Altman was named executive director of systems development at **Paramount Pictures Corp.** in Los Angeles. He is responsible for systems planning, development and support for the firm's motion picture and corporate financial systems. He reports to Warren Ferriter, senior vice president of MIS.

Altman had been executive director of systems and programming at 20th Century Fox for the past two years. He has also held IS positions at Security Pacific Bank Corp., First Interstate Bancorp and IBM.

He holds bachelor's and master's degrees in mathematics and computer science from the University of Michigan.

Joseph Balnave has been named director of MIS at **Ferro Corp.**, an industrial materials manufacturer based in Cleveland.

Balnave had been vice president of MIS at Rubbermaid, Inc. for seven years. Before that, he was corporate director of MIS at Picker International, Inc. from 1981 to 1984 and corporate director of MIS at White Motor Corp. from 1978 to 1981.

He holds a bachelor's degree in mathematics from the Detroit Institute of Technology and an MBA from Wayne State University.

Ancient tastes, modern ideas

Corporate taboos crumble as Allen challenges Sears Mortgage IS staff

BY CAROL HILDEBRAND
CW STAFF

It is rather incongruous that a woman with Leilani Allen's distaste for hierarchy should collect artifacts from ancient Egypt, one of the most stratified of all cultures. But then, maybe she could teach a pharaoh how to let his people empower themselves.

Allen, senior vice president of information technology at Sears Mortgage Corp., has transferred the fruits of a rich career in management consulting over to management itself and has built a working philosophy that comes from about as far away from a mainframe glass house as you can get.

A childhood spent racketing around Europe and Asia taught her the value of being exposed to a wide variety of cultural influences. As a military brat, she went to eight elementary schools and four high schools, finally graduating in Okinawa, Japan.

"What puts me out of step with the rest of data processing is that I don't believe in black or white. No matter what subject you bring up, I can mention a culture that does it the opposite way," Allen says.

Her diverse background includes work as an educator, a stint as head of a one-woman consulting outfit, information systems jobs at two user firms and positions at two information technology vendors.

"I think it gives me a breadth of experience you would never get staying in one company," she says. As a consultant, she adds, "You can deal with people from 300 companies during the course of a year."

Allen, 42, combines her nontraditional management approaches with an energy level that even she admits can leave colleagues in the dust. She says that her friends fear going on vacation with her because sightseeing with her leaves them more exhausted than they were before they left.

Allen's energy and forcefulness for change is already having an impact at Sears Mortgage, a mortgage lender with Sears, Roebuck and Co.'a Coldwell Banker real estate group.

Continued on page 98

PROFILE: Leilani Allen

Michael Abramson

Position: *Senior vice president of information technology, Sears Mortgage Corp.*
Mission: *Generate true group thinking in projects, cut through bureaucratic red tape and encourage employees to express opinions on managerial issues*

Mature firm plans an IS-driven overhaul

BY MITCH BETTS
CW STAFF

Maybe the key to successful re-engineering is putting old projects in the freezer.

At PHH Corp., a $4 billion company based in Hunt Valley, Md., a big part of the strategic plan is to freeze investments in the automation of "business as usual" and apply those resources to radically alter the business. When PHH assessed its information systems use, said Richard A. Bolandz, corporate vice president of information strategy and technology, "Only 18% of our technical resources were focused on something other than keeping the lights on."

PHH has an ambitious initiative under way to use information technology to dramatically transform its maturing stable of businesses — vehicle management, real estate and relocation services — into more nimble competitors.

Speaking at a recent seminar held in Baltimore by Loyola College's Lattanze Center for Executive Studies in IS, Bolandz defined strategic planning as "positioning the corporation to adapt to change before the marketplace does it to you."

The business problem was that PHH's "cash cows were maturing fast," profit margins were thinning, and the company's IS infrastructure was not capable of supporting rapid business change, he said.

Because of its many acquisitions, PHH had a hodgepodge of incompatible systems in several countries. "We did not have a data architecture," Bolandz noted. "We couldn't find [the client name] IBM in each of our systems because we called them different things in different systems." Consequently, PHH decided to invest only in applications that are portable among different hardware platforms, establish a data architecture and other corporatewide computing standards and consolidate its data centers, he said.

In essence, PHH is creating a global processing network that will allow it to manage the accounts of multinational clients in a common database that will permit cross-selling of PHH's various business services.

For such a major re-engineering effort, Bolandz said, he is fortunate to have strong support from the company's chairman, who made a speech that employees now call the "get on the train or get in front of it" speech.

Still, the hardest part of a "technology-enabled business transformation" is getting people to change the way they do things, Bolandz said. Selecting and retraining the IS technical gurus to become business analysts and project managers has been "a very gut-wrenching process," he said.

Ancient tastes, modern ideas

CONTINUED FROM PAGE 97

Based in the Chicago suburb of Riverwoods, Ill., Sears Mortgage employs about 2,000 people.

Allen has been on board slightly more than three months, and she says she's been able to get things done much faster because there's simply less bureaucracy to deal with.

"Leilani was hired to be a change agent in information technology," says Gary Summers, second vice president of information technology development and one of Allen's direct reports. "She's turning us from a systems emphasis to that of a business based on customer/client relationships."

Allen devotes half of each monthly staff meeting, for example, to developing some management skill. Possible topics might include negotiating skills, cost/benefit analysis or effective writing — "and nothing on Cobol," Allen says.

Summers points to Allen's appointment of information technology liaisons for each major department at Sears Mortgage as yet another example of refocusing.

Already, Allen says, she has reorganized her department into three different branches and received approval to hire vice presidents for two of the new branches.

"At my old company, that would have taken me at least a year, if not two," she says. Allen has also rewritten job descriptions and adjusted salaries accordingly at Sears Mortgage and made the information available to her staff. Her proposal on incentive bonuses was submitted to her entire staff for review.

"The old taboos are dropping away. There are very few things that ever have to be kept quiet," she says.

Allen says that a wide-open management style lets her generate true group thinking on a project, cutting through enough layers of bureaucratic thinking and employee reluctance to challenge the boss.

When something needs to be done, she appoints someone to draft a proposal on the project. Everybody is then expected to give input, but only for a specified time frame. After that, ideas are modified into a proposal that is acted on.

"You have to get them into the decision-making process without falling into analysis paralysis," she says.

This accomplishes the dual purpose of giving greater buy-in on the project while reducing the tendency to balk at putting ideas up for discussion. "If everybody's stuff is subject to criticism, it becomes the norm. When nobody is being singled out, it diffuses the sensitivity usually attached to criticism," Allen says.

Good idea — NOT

Allen says that she has had proposals kicked back to her with the proverbial "NOT" stamped on it by her employees. "The manager does not have to be right. If you are serious about asking for input, the rules have to apply to you, too," she says.

Such openness does not go unappreciated by Allen's staff. "She's fair but demanding," Summers says. "She wants us to grow and be challenged in our positions. She expects a lot, but it's no more than she expects from herself."

A career in computing was not Allen's goal for the first 24 years of her life. Her footloose childhood had drawn her to the arena of global politics. While finishing her Ph.D. dissertation in international political science, she took a job as a credit authorizer at Visa International, Inc. By that time, she says, she knew she wanted out of the academic life but wasn't sure what her new direction would be.

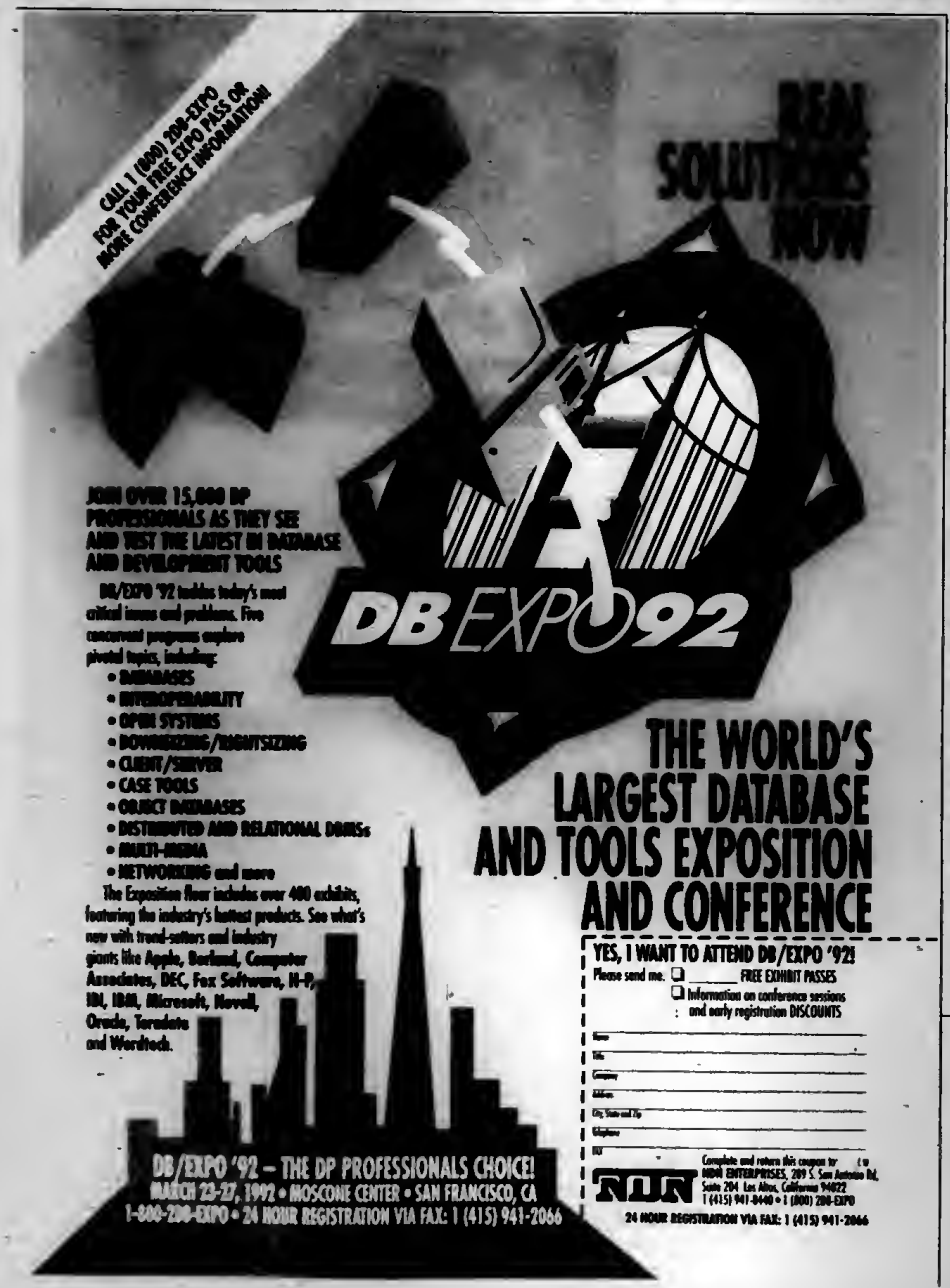
Working with computers in an academic environment had left her cold, but seeing the possibilities for IS in a commercial atmosphere was an awakening.

"It was kind of like talking to the burning bush," she says of seeing the potential that real-life applications had to offer. "I said, 'This stuff is great. This is what I want to do.' "

In addition to Visa, Allen has worked at Boole and Babbage, Inc., Amdahl Corp. and most recently at a large Chicago-based insurance firm.

Knowledge workers in the 1990s require different management methods than in the past, Allen says, and she has evolved her methods to fit a work situation that she says is more a marriage of equals than a traditional hierarchy. But one thing that has never changed is her energy.

"People are probably wondering when I'm going to slow down," Allen says. "They haven't realized that I'm not going to."



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COMMENTARY

N. Dean Meyer

Try internal contracting

"Cal, you're the best general contractor in town. I'd like you to build me a house."

"Sure, Dean. You got plans?"

"Now, just make it big enough for two of us — oh, and we like to give a lot of parties."

"OK. Of course, I'll need to ask you questions as we go. . . ."

"Sure, Cal. I want to participate in the decisions."

"Shall I just send you an invoice when we're done?"

"That'll be fine, Cal. Any idea when you'll be done?"

"Not really."

"OK, Cal. Just start as soon as you can."

Sound ridiculous? Would you expect Dean and Cal to have a few fights along the way, and perhaps even end up in court?

The sad truth is that most IS departments operate exactly this way. Projects are initiated without clear mutual understanding, and, in some cases, without even knowing who the customers are. These IS departments are neglecting a critical business practice: contracting. Projects should have an actual contract between IS and the users.

I'm not suggesting piles of legal terms and conditions that must be negotiated before IS starts a project. A contract is simply a clear mutual understanding between a customer and a supplier. It contains the following seven essential elements:

- The name of the customer.
- The name of the supplier.
- The name of the product (e.g., a developed system or just expert time).
- A description of the product, perhaps including specifications.
- The delivery date.
- The price — or at least direct costs and level of effort.
- The customer's responsibilities and contingent assumptions.

A contract is not the same as a "systems request form." It is not a wish list or backlog but, rather, a solid commitment to deliver a specified product at an agreed-upon time.

It need not be limited to systems development projects. IS has a diverse product line that includes consulting services, implementation projects and ongoing level-of-service agreements for processing, maintenance and support.

A contract may be verbal, though we recommend it be written in the form of a memo of understanding or a half-page form. The key is to establish a clear agreement and common expectations before a project starts.

An ounce of prevention

At Koch Industries, a Wichita, Kan.-based manufacturer, CIO Brad Hall says clients initially reacted negatively to contracting, feeling that it was bureaucratic. But, Hall says, "the added paperwork will pay back many times over if misunderstandings are minimized." A few minutes spent coming to agreement in advance can save days of management meetings to resolve disputes later.

Another benefit of contracting can be cost savings. A Canadian company found itself burdened with a huge, top-down information engineering and systems migration effort. The project seemed to take on a life of its own and continually demanded more resources as it pursued ever-expanding objectives.

When the company adopted the concept of "no customer, no work," it found nobody willing to sign the contract and pay the bill. While the project may have seemed technically logical, the benefits were lacking.

Of course, some common sense is required. It doesn't make sense to write up a contract for every little phone call. On the other hand, even small "enhancements" can grow into major disputes if the clients and IS staff don't have common expectations.

Therefore, "level of service" agreements can cover many of the small, ongoing services that add up to significant time commitments.

Know your stuff

A prerequisite to the discipline of contracting is an understanding of the IS product line. A typical IS function can identify up to 200 products, each distinct in its deliverables and accountability.

By deliverable, I mean products that are generally expressed as nouns (like "developed systems"), not verbs (like "programming"). While not a trivial task, asking each IS group to list its products is in itself a powerful step toward customer focus.

Executives may preach the values of total quality management, but speeches and training have a limited impact on day-to-day practices. The discipline of contracting institutionalizes entrepreneurship. Hall adds, "We feel that a culture of clear contracting is vital to providing satisfaction to our customers."

Meyer is president of N. Dean Meyer and Associates, Inc., an executive consulting firm in Ridgefield, Conn.

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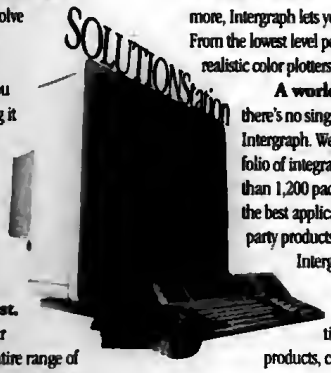

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BOOK REVIEWS

Re-engineering lessons fit for any IS shop

THE SILVERLAKE PROJECT: TRANSFORMATION AT IBM
By Roy A. Bauer, Emilio Collar and Victor Tang
Oxford University Press, $24.95

In the mid-to-late '80s, the development staff at IBM's Rochester, Minn., business unit had lost touch with the needs of its customers and had little idea of how to deal in a global marketplace. Then began a metamorphosis from a somewhat plodding, profit-losing organization to a $14 billion entity and producer of the wildly successful IBM Application System/400 mid-range system.

The Silverlake Project is a crisp, clear account of how the Rochester business unit made a complete turnaround and won the 1990 Malcolm Baldrige National Quality Award for its efforts. More importantly, the experiences the book highlights can serve as a valuable model for information systems managers who want to instill a sense of teamwork in their own ranks during overall corporate change.

The enormity of the project at IBM can be illustrated by pointing out that if IBM sold its AS/400 division tomorrow, the unit would emerge ahead of Digital Equipment Corp. as the second largest computer company in the world today. Second, in fact, only to IBM itself.

Refreshingly, the authors — three key employees involved in the project — paint an honest picture of the Rochester work force at the time.

While it seems like a no-brainer by today's standard of pushing toward "market driven" business practices, the authors point out that in the earlier days of computing, engineers and executives at large computer firms became quite comfortable in the role of educating and directing the customer.

The story begins with the 1986 arrival of Tom Furey as director at the Rochester-based development laboratory and chronicles how this relative unknown in the IBM world moved from inspiring little initial confidence to actually launching the AS/400 28 months later.

SALLY CUSACK

ACCIDENTAL EMPIRES
By Robert X. Cringely
Addison-Wesley Publishing Co. $19.95

Accidental Empires or "How the boys of Silicon Valley make their millions, battle foreign competition and still can't get a date," is engaging, well-written and funny. It'a also snide, rude and arrogant.

Don't buy this book if you're hoping to get a fresh view of Silicon Valley from an insider. This one is mainly one long string of much-publicized, warmed-over anecdotes about several of Silicon Valley's entrepreneurs and the early days of the personal computer industry.

If you listen to Cringely, the personal computer business was started entirely by accident by a bunch of geeks who fumbled along and — even at the time they were raking in big dollars — were too slow to appreciate the importance of what they were doing.

Cringely, who writes a gossip column for *Infoworld*, takes his shtick and sticks it to everybody in sight. He says the PC industry was created and defined by nerds who are either consumed with guilt (Mitch Kapor); sociopathic (Steve Jobs); or have greasy hair, an out-of-whack libido and a preoccupation with cars (Bill Gates, Gates and Gates).

MICHAEL ALEXANDER

CONFIDENTIAL INFORMATION SOURCES: PUBLIC AND PRIVATE
By John Carroll
Butterworth-Heinemann, $45

TRW, Inc., Equifax, Inc. and TransUnion Credit Information Co. — the three power houses of the consumer credit industry — collectively hold in their computers personal information on virtually every adult in North America, according to author Carroll. The information these firms have on file can determine whether a person gets a job, buys a home, drives s car, runs for office or provides for dependents. Yet, the firms are not held accountable for how the information is collected, to whom it is given and how it is secured against improper disclosure.

Carroll, a professor of computer science at the University of Western Ontario and a highly respected computer security expert, digs into the important issue of balancing the needs of commercial organizations to collect data on employees, customers and others with the need to protect the privacy of individuals.

The damage being done to privacy by cheap and easy access to personal information databases is significant but not irreversible, he says. This book should be required reading for legislators and individuals concerned about the use and misuse of computerized information, as well as IS professionals responsible for addressing information privacy issues.

MICHAEL ALEXANDER

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- Distributed Technology
- Advanced DB2 Users
- Performance
- Decision Support/ Management

Other highlights are the new "Star Track" featuring speakers considered to be the best of the industry; an "Encore Track" offering second opportunities to hear favorite speakers; and, for the first time, "Exhibit Only" passes.

What Makes IDUG Conferences Worth the Investment?

IDUG is an independent, non-profit, volunteer-driven organization consisting of user, associate and vendor members. IDUG conferences stress objective, fresh presentations geared strictly to users, while vendor and IBM participation bring the conference full circle. Meetings of special interest groups, highly informative panel presentations, and an impressive display of new products and technology provide conference participants with unmatched take-home value.

Peer networking opportunities — among a strong international presence — are limitless. Just as important, the cost to attend is minimal: $795 (before March 20) purchases a one year IDUG membership and full conference registration, including meals.

This year's keynote speakers include:

Jeff Tash, founder and president of Database Decisions, presenting *"DB2 as a Foundation for IBM's Frameworks"*;

Earl Wheeler, senior vice president and general manager of Programming Systems for IBM, discussing IBM's newest composite applications, *"The Information Warehouse Framework"*;

Colin White, founder and president of Database Associates International, presenting new information on *"DB2 Interoperability"*; and

Gabrielle Wiorkowski, founder and president of Gabrielle & Associates, presenting *"Index Design, Joins, and Subselect Performance."*

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CALENDAR

The Society for Information Management's (SIM) 1992 Institutional Member Conference will be held April 1-3 at the PGA National Resort in West Palm Beach, Fla.

Under the conference theme of "Information Technology: Shaping a New World," the event includes a pro/con information systems executive debate on the topic, "Do IS executives shape or enable business strategy?" Speakers include CSC Index, Inc. Chairman Jim Champy, Wharton School Dean Tom Gerrity and MIT Media Lab head Nicholas Negroponte.

For more information or to register, contact SIM in Chicago, Ill. (312) 644-6610.

MARCH 29-APRIL 4

The Seven Eastern Regional Group. Clearwater, Fla., March 29-April 1 — Contact: Diedrich E. Towne Jr., Syracuse, N.Y. (315) 428-6080.

International Symposium on Parallel Processing. Beverly Hills, Calif., March 30-April 2 — Contact: Larry Canter, Computer Systems Approach, Inc., Fullerton, Calif. (714) 738-3414.

Landmark Networking Conference. New York, March 31-April 2 — Contact: Frank Tolly, Virtual Systems, Sea Girt, N.J. (908) 449-7999.

Patricia Seybold's 1992 Technology Forum. Cambridge, Mass., March 31-April 2 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

International Conference on Multichip Modules. Denver, April 1-3 — Contact: International Society for Hybrid Microelectronics, Reston, Va. (703) 471-0066.

APRIL 5-11

ServiceTrends Executive Ninth Annual Conference. Boston, April 5-7 — Contact: Datapoint/Ledgeway, Framingham, Mass. (508) 370-6262.

The Information User Association (IUA). Dallas, April 5-9 — Contact: Greg Dummer, IUA, Chicago, Ill. (312) 644-6610.

Virtual Reality Expo '92. New York, April 6-8 — Contact: Marilyn Reed, Meckler Conference Management, Westport, Conn. (203) 226-6967.

James Martin World Seminar. New Orleans, April 6-10 — Contact: Susan Levine, Extended Intelligence, Chicago, Ill. (312) 346-7090.

Defense System Software Seminar. Boston, April 7-9 — Contact: David Mabor Associates, Inc., Needham Heights, Mass. (617) 449-6554.

Supercomputer Conference. Newport, R.I., April 7-9 — Contact: Dr. John Miguel, Federal Information Processing Council, Middletown, R.I. (401) 641-4591.

APRIL 12-18

The Borland International Developers Conference. Monterey, Calif., April 12-15 — Contact: Borland International Developers Conference, CT Meeting Planners, Inc., Monroe, Conn. (203) 261-6227.

United States Society of Wang Users (USSWU). Washington, D.C., April 14 — Contact: USSWU Office, Chicago, Ill. (708) 652-3888.

CIME/Design. Detroit, April 14-16 — Contact: Joe Baxter, CIME/Design, Chadds Ford, Pa. (215) 444-9690

Auditing Information Systems Computer Contracts. Detroit, Mich., April 15 — Contact: Spud Watkins, EDP Auditors Association, Inc., Troy, Mich. (313) 769-8300.

APRIL 19-25

Network Analysis Users Group Conference (NAUG). Monterey, Calif., April 20-24 — Contact: Sandy Moretto, NAUG Headquarters, Menlo Park, Calif. (415) 688-2836.

Netcom West '92. Anaheim, Calif., April 21-23 — Contact: Jim Kleiber, Information Development Corporation, Silver Spring, Md. (301) 565-4233.

Supercomputing Japan '92. Yokohama, Japan, April 22-24 — Contact: Meridian Pacific Group, Inc., Mill Valley, Calif. (415) 381-2255.

APRIL 26-MAY 2

Computer Audit, Control and Security Conference. Philadelphia, April 26-May 1 — Contact: EDP Auditors Association/Foundation, Inc., Carol Stream, Ill. (708) 682-1200.

Software Maintenance and Re-engineering. Chicago, April 27-29 — Contact: Applied Computer Research, Phoenix, Ariz. (602) 995-5929.

X World. New York, April 27-30 — Contact: Jennifer Fischer, SIGS Publications Group, New York, N.Y. (212) 274-0640.

Downsizing/Rightsizing Corporate Computing Conference and Exposition. Los Angeles, April 27-May 1 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-4200.

USE, Inc. Conference. San Francisco, April 27-May 1 — Contact: Carolyn Abell, USE, Inc., Bladensburg, Md. (301) 699-9336.

DocWorld '92. Boston, April 27-May 15 — Contact: Rogal America, Newton, Mass. (617) 244-2800.

Directions and Implications of Advanced Computing Symposia. Berkeley, Calif., May 2-3 — Contact: Doug Schuler, Seattle, Wash. (206) 865-3832.

MAY 3-9

Information Technology Association of America (ITAA) 76th Management Conference. New Orleans, May 3-6 — Contact: ITAA, Arlington, Va. (703) 284-5333.

ASM'S 45th Information Systems Conference. Montreal, May 3-6 — Contact: Terri Gibbons, Association for Systems Management, Cleveland, Ohio (216) 243-6900.

Pen-based Computer Conference. Boston, May 4-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Eastern Communications Forum '92. Rye Brook, N.Y., May 4-6 — Contact: Eastern Communications Forum, Chicago, Ill. (312) 938-3500.

Netcom '92. Hartford, Conn., May 5-6 — Contact: Daniels Productions, Inc., West Hartford, Conn. (203) 561-3250.

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COMPUTERWORLD
The Newspaper of IS

The layoff legacy: Poor morale, anger pervade employee ranks

BY MARY LOU ROBERTS
SPECIAL TO CW

All over the U.S., companies are pruning staffs, chopping departments and redistributing work loads among smaller numbers of people. These cutbacks have affected virtually every department, but they are felt with particular force in information systems.

That's because IS not only must struggle with its own reductions but is also being asked to come up with systems that can help other downsized departments perform more effectively.

Many of the layoff "survivors" say they are frustrated working longer hours with no increase in compensation and feel somehow betrayed by management. They also have a sense of being trapped in a job market that offers few, if any, alternatives — and they feel angry, pure and simple.

"When the stress is this high, it's not possible to keep staff morale up," says Paul Veremko, senior systems analyst at Bear Creek Corp. in Medford, Ore. "You just turn off. You cease having professional pride in what you do."

The fact that his company is now actually rehiring some people after it downsized the staff doesn't make Veremko feel much better. "It shows the lack of good planning. Management hasn't had the right bodies in the right place at the right time," he says.

Broken promises

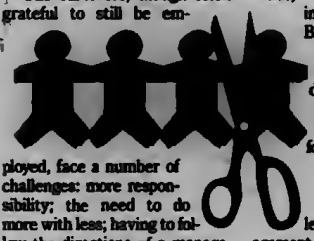
ARKLA, Inc., a natural gas company in Shreveport, La., that was hit hard by the industrywide and economic recession, has also tightened up its IS operation.

According to Paul Koerner, senior systems analyst, "The staff reaction has been varied. It has ranged from 'We knew something had to be done' to outright anger. A lot of people here never expected to work anywhere else. It's like a bond has been broken."

Dudley Cooke, president of the Executive Insight Group, a management consulting firm in Bryn Mawr, Pa., says companies seem blind to what survivors of cuts go through.

Those who depart get salary and benefits continuation plans, counseling and outplacement services, he says, but companies "don't pay nearly enough attention to the real needs and difficulties of those who have to stick around."

The survivors, though often grateful to still be employed, face a number of challenges: more responsibility; the need to do more with less; having to follow the directions of a management they perceive to have caused pain to themselves and former co-workers and modified work processes that no one has time to explain. Employees say they feel frustrated that they have no control over the situation yet don't feel they can leave in this economy.



Most agree that the quality of management planning and communication can make a considerable difference in how remaining workers adjust.

Ralph Loftin, president of Loftin Associates, a Newton, Mass.-based management consulting firm, says that simply acknowledging the pain inherent in the situation and making allowances for the necessity of working through feelings of loss and anger can help considerably.

What managers forget, Loftin says, is that "they planned the layoffs, so they have had longer to think about it and cope with it."

Whether a layoff is planned or not, "There is always a sorting-out period," says Joe Bove, former IS manager of policy and process at Sun Oil Co. in Philadelphia, who survived six layoffs and reorganizations in eight years before leaving in 1991 to become an independent consultant.

Bove says real problems crop up when management doesn't acknowledge that adjustments in work process and work load are necessary and instead allows employees to stagger along as best they can.

It's natural, he says, for remaining employees to struggle with more work initially, but that shouldn't be the case six months down the road. If the department is still swamped at that point, management hasn't done a proper job of reprioritizing and reassigning responsibilities.

Keeping morale at an acceptable level in the midst of mayhem isn't only management's job, however. Employees, too, can take an active role in improving a bad situation.

Koerner says he's found physical exercise to be a good vent for stress. Veremko suggests that even if you don't think you'll use it, preparing a resume can be a positive step, because it gives you a sense that you have options and it helps you develop a more balanced and pragmatic attitude.

"Stand back and look at the situation in the perspective of what's important in your life," he says. "If all of your ego is involved in your work, then you're going to suffer."

Find the good

Others try to focus on the positive, make themselves as indispensable as possible and emphasize personal development.

Ira Rosenberg, systems project leader at Hunt-Wesson, Inc. in Fullerton, Calif., says, "Try to stay as current as possible with technology. And don't fight change. Anything new that comes along, I volunteer for."

Wayne Evans, senior programmer/analyst at Blue Diamond Growers in Sacramento, Calif., agrees. "I try to stay as close to the cutting edge as I can for those technologies that are really important to this company. The layoffs are a reality — something the company has to do if it is going to remain viable."

Roberts is a free-lance writer and consultant based in Glenside, Pa.

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Making the grade takes research

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is R. Max Steiner, a marketing director at Corico Recruiters and Contract Solutions, Inc., both located in Salem, N.H.

Q I am a programmer analyst with almost five years of experience at my current job — my first out of college. I am now looking again and am frustrated by the hiring process. It seems because there are so many job candidates, surfacing as the best choice is only a matter of luck. What can I do?

Initials and town withheld

A Surfacing as the top choice is not a function of luck, it is a function of research. Investigate the company and its products. Investigate their development platforms and applications. Know the company's future directions and past triumphs. Once in the interview, voice your own issues. Ask the manager why he likes working there and about possible future directions. Interview the interviewer.

Q I am an information systems consultant and have worked on temporary contracts for close to 10 years. I am now interested in permanent employment. Although my technical abilities are outstanding, I am worried that I will not be taken seriously. Are employers likely to think my interest is just a reaction to a bad economy?

Initials and town withheld

A Your concerns are probably justified. However, by knowing this in advance, you can address and overcome these obstacles. This is an extremely busy time in contracting, which demonstrates that the economy is not motivating this career move. Your decision is probably based on security, benefits and education reimbursement.

Whatever your motivation is, discuss it, even if your interviewer fails to ask.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I have been working as an IS manager for a large Australian retail chain for more than three years and am currently completing a master of business degree in information technology.

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G.W.
Windsor, Victoria, Australia

A Continue to contact agencies as well as pursue personal contacts. There are agencies that are willing to work with people who require sponsorship. Keep trying to find them. If your talent is in demand, a motivated recruiter will find a prospective employer willing to work through your green card issue.

Q I have begun to search for a new job. I feel confident that I have the skills and work ethic to make an excellent employee, but I want to search properly.

Are employment agencies any good? If I work with an agency, should I not search on my own? I guess I am wondering if an agency can help or hurt me.

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A Working with an employment agency can prove helpful, but maintain control. Many companies' hiring managers choose to work exclusively with agencies. They allow the agency to act as a screen and review a smaller, more targeted group of applicants.

However, there are disadvantages to registering with an agency. The bottom line is finding a trusted recruiter who will only follow your instructions.

Here are some conditions you may want to impose: Your resume should go nowhere without your prior consent; agencies should know where and when you wish to be contacted and follow those instructions; and you should work with only one recruiter, not a team of recruiters.

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JOB SNAPSHOT

Data center supervisors

Job Snapshot is a monthly column that provides detailed information on selected job categories.

▸**JOB REQUIREMENTS:** Technical skills are less important than management abilities. A data center supervisor, of course, must understand the particular hardware and software platforms in use and have at least some communications know-how, but that's just the start of what this job requires. To be suitable, a person must be able to see how data centers at sites across the company can share information in a way that will best support business goals, and how the data center's systems fit into the big picture of the network.

▸**EDUCATION REQUIREMENTS:** Many of those on the job today have little formal technical education — at most a two-year degree from a technical or community college. Experience is still more important than academic education, but a four-year computer science degree is becoming more of a requisite.

▸**CAREER PLUSES:** For those who like change and are challenged by dealing with new problems every day, this job is a good fit. You often get to deal with multiple levels, from the chief executive officer to the mail-room clerk.

▸**CAREER MINUSES:** Data center automation has long been a hovering threat. Not all supervisors see "lights-out" as a likely occurrence, however, and note that since the concept first surfaced in the 1970s, jobs have evolved rather than simply disappeared. Whatever happens, some counsel that it's a good idea to become familiar with new technologies such as client/server and distributed processing. Data center supervisors are also under constant pressure, having responsibility for the center 24 hours a day.

▸**SALARY ESTIMATES:** *Computerworld*'s 1991 salary survey put the average annual wage for data center supervisors at $31,669. However, there can be swings as large as $10,000 in either direction, depending on industry and location.

▸**RECENT CHANGES:** The required skill set is expanding as a result of technology advances. Automated data center tools have eliminated the need for some skills but have created a need for more supervision. It's become easier for people with less experience to miss things and get you in trouble, one operations supervisor says.

Researched and written by Kathleen Gow, a free-lance writer based in Medford, Mass.

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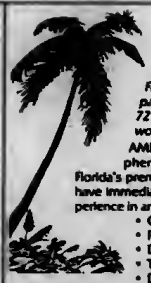

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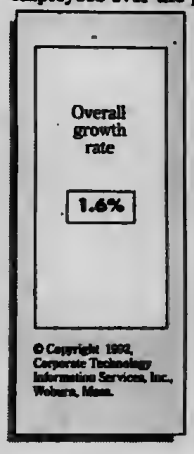

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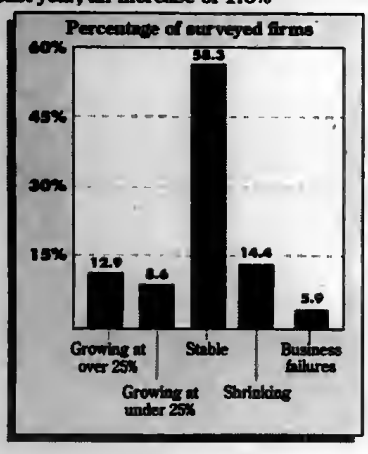

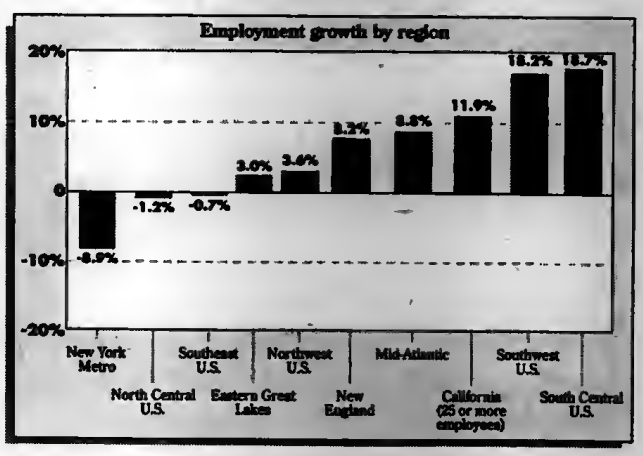

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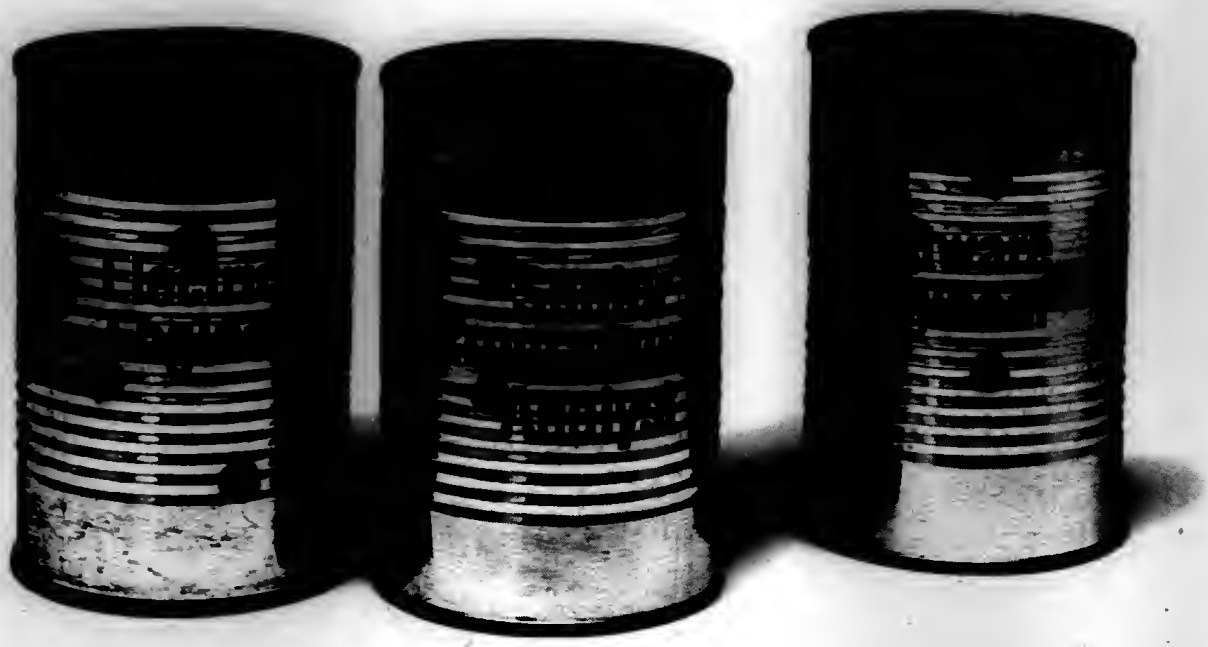

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MARKETPLACE

Word processing: Why buy fancy if plain will do?

BY ALICE LAPLANTE
SPECIAL TO CW

CompuServe, Inc. in Columbus, Ohio, long ago standardized on WordPerfect for its internal personal computer users. However, when WordPerfect Corp. introduced a "lite" version of its best-selling package — a lower cost, stripped-down product called LetterPerfect — CompuServe's information systems department realized it could halve the out-of-pocket cost of purchasing the software by switching many users to the low-end product.

"Most of our users wouldn't even notice the difference," says Mark Freeman, manager of microcomputer services at CompuServe.

Many IS professionals are realizing that users are overwhelmed by feature-packed word processors and are turning to simpler products to trim purchase, training and support costs.

The new lite packages retail for approximately $250 — less than half the price of their full-featured counterparts. But, users say, low cost doesn't necessarily mean low functionality.

"We'll give Ami Pro to certain power users," says Dave Garretson, a senior analyst of distributed computing at Northwestern National Life Insurance Co. in Minneapolis. "But because Professional Write is so easy to support, I prefer most users stick to that."

Low-cost word processors offer the standard basic features needed by most business users, says Mike Anderson, program director of Gartner Group, Inc.'s office information services in Stamford, Conn.

These basic features include document creating, editing and printing, as well as font attributes, text formatting and, increasingly, mail-merge, spell checker and thesaurus. LetterPerfect, which retails for $229, has all this plus labels-generation and document-preview features.

Lower priced products also require less processor power, memory and disk space. Unlike full-function packages, which run poorly on anything less than an Intel Corp. 80386SX with 2M bytes of radom-access memory, a DOS-based lite word processor runs adequately on floppy-based, 8088-based systems while Microsoft Corp.'a Windows packages perform well even on 80286-based systems with 1M byte of RAM.

Some even have all the network support that their expensive brethren offer, including Professional Write Plus, LetterPerfect and Lotus Development Corp.'s Lotus Write.

No bells and whistles

These products typically lack report documentation features such as automatic table of contents or index generation, table creation and editing, sophisticated graphics import/export and manipulation and certain advanced macro and formatting capabilities, says John Murphy, editor of "The PC Street Price Index," a monthly newsletter published by Metro Computing in Cherry Hill, N.J. But, he adds, many users will never need to create a footnote, much less use these other features.

Still, low-end packages are not for everyone. There will always be employees who need the power of a Microsoft Corp. Word, Ami Pro or WordPerfect.

In such instances, a dual word processing standard is the logical solution, but experts say absolute compatibility must exist between the two packages.

The Jackson National Life Insurance Co. in Lansing, Mich., for example, was searching for a cheaper, easier-to-use alternative to WordPerfect. Teresa Spalding, the company's training and PC support manager, tried LetterPerfect and several other low-end products before deciding on Textra, a $95 DOS-based package developed by Ann Arbor Software in Ann Arbor, Mich.

"When you're putting a word processor on 400 or 500 machines, the cost definitely adds up," says Spalding, who paid $250 per copy for WordPerfect and approximately $30 per copy for Textra.

Textra also has an automatic conversion for the WordPerfect format that left virtually all format codes intact, she adds.

A small sacrifice

In fact, Spalding says, users needed to sacrifice surprisingly little and enjoyed easier training and use. Textra has also cut support costs because users needed less help, she adds.

At Northwestern National Life, most PC users have received Professional Write Plus, a $249 Windows-based package from Software Publishing Corp. in Santa Clara, Calif. "We have a huge installed base of 286 machines, and if you want to run Windows and a word processing package, you have to travel pretty light," Garretson says. Professional Write Plus includes an integrated electronic-mail front end and supports the leading graphics and text formats.

Other makers of high-end word processors are making lite versions of their products. Lotus, which markets Ami Pro for $495, has a simplified version of that package called Lotus Write for Windows, which costs $199.

Another major player is Cupertino, Calif.-based Symantec Corp.'s JustWrite, a Windows-based word processor for $199.

In addition to pull-down menus and mouse support, JustWrite has 25 document templates, ranging from memos to complex business documents. Network and E-mail support are also included.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Checklist of things to consider when buying low-cost word processors

- ☐ Compatibility with full-function word processors used.
- ☐ Easy enough to learn, use and support.
- ☐ Allows more than one document to be open simultaneously.
- ☐ Supports the typical-size document needed.
- ☐ Number and type of import/export graphic formats supported.
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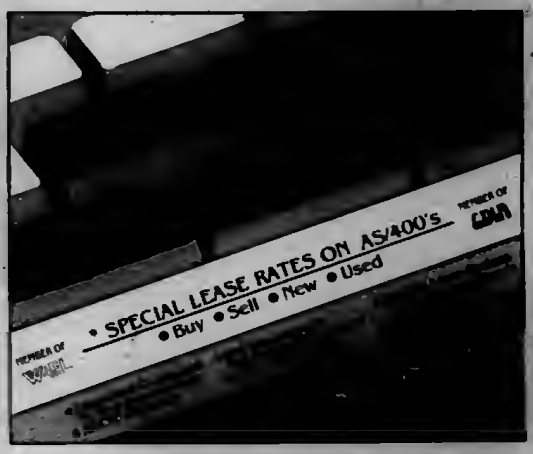

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PS/2 Model 80	$700	$900	$325
PS/2 Model 80	$2,050	$2,100	$1,100
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Portable 386	$2,000	$2,125	$1,000
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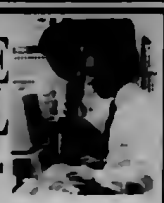

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ADVERTISERS INDEX

AT&T Business Communications Services 66-69
AT&T International Communications Services 69
BMC Software 78
Borland International 17
BSM Corp 104
Bull Worldwide Information Systems C4
Candle Corp 36
Cincom Systems 98
Computer Associates 3, 8
Computer Systems Advisers 71
Computron 94
CW Circulation 93
CW Marketing 106
CW Recruitment 34, 44, 98
DB Expo 98
DCA 72
Digital Equipment Corp 22-23, 52-53, 66-67
Dynasoft 56
Dysan International 44
Epson America 80-85
Fecit 24
Faulkner Technical Reports 57
Fischer International 59
Hewlett-Packard 18-19
IBM 26-27, 40-41, 62-63
IDEAssociates 38-39
IDUG 102
Information Resources 15
Information Builders 20
Ingres 101, 103, 106
Innovation Data Processing 7
Intergraph 100
Interrup 90
IQ Software 94
Knowledgeware 25
Lotus Development Corp 42-43
Micro Focus 11
NCR 29-31
Novell 54
Oracle Corp 8, 9
Prism 56
Progress Software 58
Ross Systems 46
SAS Institute 46/47, 70
Software AG 60
Sterling Software 65
Sun Microsystems 48-49
Sybase, Inc 13
Systems Center 99
3M 50-51
Texas Instruments 34-35
Unix System Laboratories 96
VMark Software 98
Wyse Technology 76-77
Zenith Data Systems C3

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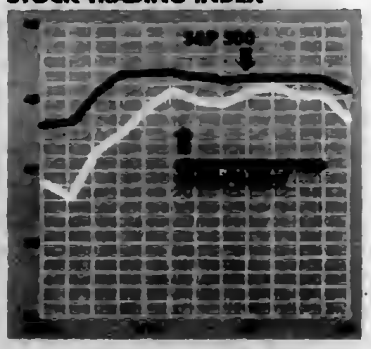

Industry Almanac

SECTOR FOCUS: MIDRANGE SYSTEMS

Midrange Computer Outlook
John Levinson, Gregory Gould
Goldman, Sachs & Co.

The outlook for the industry, which includes midrange hardware and software vendors, is less than rosy. Increasingly similar products will cause uninspired sales over the long term. Saturation is an issue. While there may be some new customers left — and people will upgrade their systems — high unit growth rates are a thing of the past.

Furthermore, as downsizing gains momentum, many midrange products will lose it. A vendor's business model and culture can be more important to its ultimate success than its product set.

Tandem Computers, Inc. (TDM), Prime Computer, Inc. and Wang Laboratories, Inc. (WANB), among others, are having trouble moving toward the new world from either an organizational or product standpoint. The three companies have begun to make strides, but considerable challenges remain.

Other companies may run into trouble if they depend too much on minicomputer platforms. For example, the revenue impact of **Digital Equipment Corp.**'s (DEC) VAX 9000 has been a fraction of that expected. Right after DEC announced the machine, many investors expected the company to ship more than 500 units per quarter, contributing a lot to annual revenue.

However, unit volume for that product peaked at 118 units a year ago, then declined to about 25 units in September 1991.

Customers seem to care less about such large systems, which is why companies such as **Sun Microsystems, Inc.** (SUNW) and **Silicon Graphics, Inc.** (SGI) are positioned well for the near term. Sun will be among the industry leaders in applications software breadth for client/server systems. Products based on Sun's Scalable Processor Architecture (SPARC) have about three times the unit shipment rate of SPARC's closest competitors.

The biggest piece of the computer pie will go to companies that add value to a standards-based product, such as systems integration or network services. But these vendors must first build businesses capable of making money selling look-alike products.

KIM S. NASH

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MARCH 6, 1992

TOP PERCENT GAINERS	
Go Video (H)	16.13
Apertus Technologies	15.04
State of the Art (H)	13.75
Mips Computer Systems	11.25
Control Data Corp	9.09
Dataram Corp (H)	8.99
Knowledgeware Inc	7.25
Micropolis Corp	9.86

TOP PERCENT LOSERS	
Information Resources (H)	-23.58
Sierra Semiconductor	-20.63
Chips and Technologies (H)	-17.59
Cambex Corp. (H)	-19.67
Tandon Corp	-19.19
Intelligent Electronics (H)	-15.74
Meca Software	-15.08
Comdisco Inc * (L)	-14.57

TOP DOLLAR GAINERS	
Dataram Corp. (H)	4.13
General Motors E (EDS)*	2.88
Reynolds and Reynolds (H)	2.50
State of the Art (H)	1.75
Dell Computer Corp. (H)	1.38
Autodesk Inc (L)	1.25
Knowledgeware Inc	1.25
Mips Computer Systems	1.13

TOP DOLLAR LOSERS	
Computer Sciences* (H)	-9.13
Information Resources (H)	-7.25
Storage Technology*	-8.00
Adobe Systems Inc	-8.00
Microsoft Corp *	-5.25
Matsushita Electronics (L)	-5.13
Sierra Semiconductor	-5.00
Intelligent Electronics (H)	-4.25

Communications and Network Services — Off 3.36

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
OTC	15.00	8.75	3 COM Corp * (H)	12.50	-0.63	-4.75
NYS	66.00	55.75	American Info Techs Corp *	59.25	-0.75	-1.04
NYS	41.38	32.50	AT&T	37.88	-0.75	2.02
OTC	4.25	1.25	Ariel Communication Corp	3.00	-0.25	-7.88
NYS	52.75	42.25	Bell Atlantic Corp.	42.25	-1.25	-2.87
NYS	54.12	45.13	Bellsouth Corp	45.13	-1.13	-2.43
NYS	6.38	4.75	Burr, Brown(H) Newman	5.63	0.00	0.00
NYS	65.88	30.25	Cabletron Systems (H)	57.13	-3.63	-5.67
OTC	31.00	11.75	Chipcom Corp	27.75	-1.88	-6.44
OTC	67.25	21.00	Cisco Systems Inc (H)	75.00	-3.50	-4.25
OTC	35.25	13.75	Compression Labs Inc	23.12	-3.88	-14.35
OTC	5.12	1.50	Data Switch Corp	2.38	0.00	0.00
NYS	23.63	12.38	Digital Comm Assoc *	21.00	-1.38	-6.15
OTC	21.50	8.50	Digital Systems Int l Inc.	14.00	-0.25	-1.75
OTC	8.75	3.63	DSC Communications	5.19	-0.50	-8.77
OTC	12.38	5.00	Fibronix Int l Inc.	8.25	-0.88	-8.54
OTC	36.25	11.00	Fiserv Corp (H)	31.50	-0.75	-2.33
OTC	2.75	1.13	Gandalf Technologies Inc.	2.75	0.00	0.00
OTC	2.69	1.16	Gateway Communications	1.56	-0.19	-10.88
NYS	5.25	2.13	General Datacomm Inds. (H)	4.63	-0.25	-5.13
ASE	5.88	0.50	Go Video (H)	4.50	0.63	19.12
NYS	35.00	28.13	GTE Corp *	30.13	-0.38	-1.23
NYS	70.88	50.00	ITT Corp (H)	63.88	-0.38	-0.58
OTC	36.13	24.63	MCI Communications Corp. (H)	33.50	-1.50	-4.25
OTC	14.50	5.00	Microcom Inc	11.75	0.00	0.00
NYS	16.25	8.88	Network Equipment Tech *	14.75	-1.63	-9.92
OTC	25.50	6.75	Network General	22.25	-0.63	-2.75
OTC	20.00	10.50	Network Systems Corp	13.50	-1.00	-6.90
OTC	14.50	4.31	Newbridge Networks Corp (H)	14.00	-0.25	-1.75
NYS	49.25	25.88	Northern Telecom Ltd * (H)	46.63	-1.50	-3.12
OTC	65.00	22.63	Novell Inc *	57.38	-2.25	-5.88
NYS	82.38	68.00	Nynex Corp *	72.00	-0.75	-1.03
OTC	37.50	19.50	Octel Communications Corp.(H)	33.00	0.63	1.93
OTC	11.63	5.63	Penril Data Comm. Ntwks.	8.63	-0.13	-1.47
OTC	63.00	19.75	Picturetel Corp (H)	44.50	-3.25	-6.81
OTC	19.75	9.75	Proteon Inc. (H)	15.25	-1.00	-6.15
NYS	19.75	11.63	Scientific Atlanta Inc. (H)	17.63	0.00	0.00
NYS	66.00	49.00	Southwestern Bell Corp.	58.13	-2.25	-3.73
OTC	48.75	14.25	Synoptics Communications	25.00	-0.50	-2.13
NYS	31.50	21.00	United Telecom(L)	21.88	0.00	0.00
NYS	40.13	33.75	U S West Inc	33.75	-0.75	-2.17
OTC	41.25	21.25	Wellfleet Communications	33.25	-3.25	-8.90

PC Workstations — Off 1.59

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
OTC	30.75	8.75	Advanced Logic Research	7.75	0.00	0.00
OTC	2.63	1.50	Alpha Microsystems	0.00	0.00	0.00
OTC	72.25	40.13	Apple Computer Inc *	54.00	-3.50	-6.19
OTC	32.75	14.50	AST Research Inc *	20.25	-0.75	-3.57
NYS	21.63	10.13	Commodore Int'l	12.75	-0.38	-2.85
NYS	70.38	22.13	Compaq Computer Corp.*	29.38	-0.75	-2.49
OTC	37.88	20.25	Dell Computer Corp. (H)	38.25	1.38	3.94
OTC	7.75	3.00	Everex Systems Inc. (H)	8.88	-0.13	-1.75
NYS	34.00	21.25	Harris Corp (H)	31.50	-0.12	-0.40
NYS	76.00	44.50	Hewlett-Packard Co * (H)	74.00	1.00	1.37
OTC	39.00	7.88	Mips Computer Systems	11.13	1.12	11.25
NYS	29.75	13.25	Silicon Graphics (H)	26.50	-2.13	-7.43
OTC	38.63	30.75	Sun Microsystems Inc *	31.00	-3.50	-10.14
NYS	36.50	23.38	Tandy Corp *	30.13	-0.50	-1.63
NYS	11.12	5.13	Zenith Electronics (H)	9.25	-0.50	-5.13
OTC	25.50	12.50	Zeos International Ltd	16.25	-0.25	-1.52

Large Systems — Off 3.98

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
ASE	20.63	11.63	Amdahl Corp.* (H)	17.50	-2.50	-12.50
OTC	2.63	0.88	Computer Automation Inc.	1.13	0.06	5.83
NYS	13.38	7.50	Control Data Corp	12.00	1.00	9.05
NYS	16.75	8.88	Convex Computer	14.25	-1.00	-6.56
OTC	16.63	6.00	Cray Computer	6.00	-0.63	-9.43
NYS	52.25	31.50	Cray Research Inc.*	40.88	-0.25	-0.61
NYS	22.50	10.25	Data General Corp.	11.50	-0.88	-4.17
NYS	60.50	48.50	Digital Equipment Corp.*	58.25	-3.38	-5.48
NYS	130.75	63.50	IBM*	88.38	-0.63	0.75
NYS	138.88	100.13	Matsushita Electronics (L)	100.13	-5.13	-4.87
OTC	25.50	10.75	Pyramid Technology	15.75	0.13	0.80
OTC	19.50	7.50	Sequent Computer Sys.	14.38	-2.00	-12.21
OTC	16.38	10.13	Sequoia Systems Inc.	12.25	-2.25	-3.00
NYS	54.25	27.25	Stratus Computer Inc.* (H)	51.00	-2.00	-3.77
NYS	17.63	9.50	Tandem Computers Inc.*	12.75	-0.88	-6.43
OTC	4.75	1.25	Tandon Corp	1.63	-0.31	-16.15
OTC	32.38	12.75	Teradata Corp.	25.63	0.00	0.00
NYS	11.75	8.25	Unisys Corp * (H)	9.38	-0.25	-2.60
ASE	7.50	2.00	Wang Labs Inc. (b)* (H)	6.38	-0.25	-3.77

Software & DP Services — Off 2.76

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
OTC	68.50	41.25	Adobe Systems Inc.	50.50	-6.00	-10.62
OTC	13.25	3.50	AI Corp (H)	9.50	-0.38	-3.80
OTC	59.88	26.38	Aldus Corp. (L)	29.25	-0.75	-2.50
OTC	18.75	10.13	American Software Inc. (H)	16.63	-1.38	-7.54
OTC	20.00	7.13	Ask Computer Systems (H)	16.50	0.88	4.98
OTC	62.25	23.25	Autodesk Inc. (L)	25.00	1.25	4.67
OTC	37.75	17.00	Bachman Info. Systems (H)	25.25	-1.25	-4.75
OTC	42.50	25.88	BGS Systems Inc. (H)	38.50	0.00	0.00
OTC	79.00	33.00	BMC Software Inc.	62.00	-1.00	-1.38
OTC	19.50	6.75	Boole & Babbage (H)	17.38	0.38	2.21
OTC	86.75	39.50	Borland Int'l Inc.*	70.00	-3.75	-5.08
OTC	11.25	4.75	CE Software	9.13	-0.13	-1.35
OTC	20.88	7.50	Cheyenne Software Inc. (H)	19.75	0.63	3.27
OTC	9.75	0.00	Cognos Inc	9.75	0.00	0.00
NYS	17.00	7.25	Computer Associates* (H)	15.13	-1.25	-7.63
OTC	22.75	12.00	Comshare Inc.	16.00	0.00	0.00
OTC	47.88	19.00	Easel Corp.	38.00	-4.25	-10.06
OTC	19.00	9.25	Goal Systems Int'l	15.00	0.25	1.68
OTC	32.50	11.50	Group I Software	21.50	-0.50	-2.27
OTC	7.00	3.88	Hogan Systems Inc.	5.75	0.13	2.22
OTC	38.25	19.00	Information Resources (H)	23.50	-7.25	-23.58
OTC	33.00	4.88	Informix Corp. (H)	39.38	0.13	0.44
OTC	3.63	1.00	Intellicorp Inc	2.13	0.00	0.00
OTC	30.25	16.25	Intergraph Corp.	18.50	0.00	0.00
OTC	19.00	4.88	Interleaf Inc. (H)	12.88	-0.75	-5.50
OTC	20.25	7.38	Interactiv Inc.	17.00	-0.50	-2.86
OTC	43.25	10.50	Knowledgeware Inc.	18.50	1.25	7.25
OTC	43.75	20.25	Legent Corp.*	41.00	-1.75	-4.09
OTC	40.75	18.00	Lotus Development*	32.88	0.63	1.94
OTC	7.38	2.38	Meca Software	9.00	-1.08	-15.05
OTC	22.25	11.50	Mentor Graphics (H)	19.00	-1.75	-8.88
OTC	30.25	9.75	Micrografx Inc.	23.75	-4.00	-14.41
OTC	133.25	60.50	Microsoft Corp.*	118.25	-5.25	-4.25
OTC	21.13	7.00	Oracle Corp.* (H)	18.50	-0.50	-2.50
OTC	35.63	10.75	Parametric Technology	25.75	-2.25	-8.04
OTC	10.75	5.88	Phoenix Technologies (H)	8.38	0.00	0.00
OTC	25.25	9.00	Platinum Technology	19.50	-1.75	-8.64
OTC	46.50	27.50	Progress Software Corp	44.00	0.50	1.15
OTC	28.63	11.50	Quarterdeck Office Sys	20.25	-1.75	-7.95
OTC	26.75	10.00	Realworld	21.25	0.25	1.19
OTC	19.75	9.75	Ross Systems	10.00	1.00	9.67
OTC	32.50	12.50	Software Publishing Corp.	25.13	0.63	2.75
OTC	9.50	2.00	Software Toolworks Inc.	6.25	-0.38	-5.66
OTC	7.25	1.75	Spectrum Software	5.13	0.25	4.88
OTC	15.50	9.75	State of the Art (H)	14.50	1.79	13.73
NYS	25.25	10.88	Sterling Software Inc. (H)	21.88	-0.75	-3.31
OTC	30.00	15.38	Structural Dynamics Research	20.75	-1.75	-7.75
OTC	31.75	15.00	Sybase Inc. (H)	24.29	-2.25	-8.48
OTC	51.00	16.50	Symantec Corp	41.00	-2.25	-5.20
NYS	15.50	6.38	Systems Center Inc.*	11.38	-0.13	-1.09
OTC	31.00	9.34	System Software Assoc. (H)	26.25	-1.00	-3.42
OTC	6.63	2.25	Worldsar	4.00	0.19	4.50

Semiconductors — Off 5.71

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
NYS	21.50	9.38	Advanced Micro Devices	17.13	-1.25	-6.80
NYS	12.50	7.00	Analog Devices Inc.	9.38	-0.38	-3.85
OTC	19.88	9.75	Atmel Corp.	11.12	-0.38	-3.26
OTC	14.13	7.00	Chips and Technologies (H)	11.13	-2.38	-17.59
NYS	24.50	12.38	Cypress Semiconductor Corp.	16.13	0.38	2.38
NYS	12.38	5.25	Dallas Semiconductor	9.75	-0.50	-4.11
OTC	88.75	38.50	Intel Corp. * (H)	63.25	-1.25	-1.97
NYS	12.50	6.50	LSI Logic Corp	9.50	-0.13	-1.45
NYS	22.38	10.88	Micron Technology (H)	16.88	-0.63	-3.21
NYS	62.50	54.00	Motorola Inc.* (H)	75.25	0.00	0.99
NYS	11.25	3.88	National Semiconductor* (H)	10.75	0.25	2.38
OTC	27.00	13.00	Sierra Semiconductor	18.00	-6.00	-20.63
NYS	47.63	26.00	Texas Instruments*	34.38	-3.13	-8.33
OTC	12.25	5.88	VLSI Technology	9.38	-0.75	-4.22
OTC	16.75	4.50	Weitek	8.25	-0.13	-1.68
ASE	6.25	2.00	Western Digital Corp.	4.00	-0.50	-11.11
OTC	32.50	16.50	Xilinx	27.50	-1.25	-4.35
OTC	11.50	4.25	Zilog Inc. (H)	8.88	-1.00	-10.13

Peripherals and Subsystems — Off 1.42

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
OTC	2.75	1.00	Apertus Technologies	1.44	0.19	19.04
OTC	9.13	2.75	Archive Corp.	8.94	-0.12	-1.77
OTC	28.50	10.00	Benchmarq Inc. (H)	21.63	0.00	0.00
OTC	25.50	4.88	Cambex Corp. (H)	19.12	-3.63	-19.67
ASE	11.75	7.00	Cognitronics Corp.	10.13	0.63	9.58
NYS	25.00	12.50	Conner Peripherals*	18.88	-1.00	-4.79
ASE	86.00	9.63	Dataram Corp. (H)	50.00	4.13	9.06
NYS	19.88	4.88	EMC Corp	14.50	0.75	5.45
OTC	11.25	4.75	Emulex Corp.	5.88	0.13	2.17
OTC	23.00	14.75	Evans & Sutherland	16.00	0.75	4.11
OTC	40.63	13.38	Exabyte (H)	35.75	-3.38	-8.63
OTC	27.25	14.75	Intelligent Info Systems (H)	26.50	0.12	0.47
OTC	11.25	4.00	Iomega Corp. (H)	10.13	-0.88	-7.98
OTC	32.50	14.50	IPL Systems Inc. (H)	26.75	-3.78	-12.30
OTC	24.50	11.75	Kimtron Inc.	15.25	0.38	2.52
OTC	11.75	1.63	Maxtor Corp.* (H)	10.63	-0.88	-7.61
OTC	18.00	5.50	Micropolis Corp	11.50	0.75	6.98
NYS	98.75	63.50	3M Corp	80.38	-0.63	-0.86
NYS	10.75	2.50	Prestomat Inc.	4.50	0.13	2.86
NYS	26.75	11.25	QMS Inc.	12.50	0.25	2.04
OTC	18.13	6.88	Quantum Corp.	16.63	-0.63	-3.82
OTC	12.25	5.00	Reduna Inc.	10.00	-0.79	-8.88
OTC	12.88	5.38	Revlon Equipment (H)	12.00	-0.75	-5.88
OTC	12.50	5.38	Rexon Inc. (H)	11.75	-0.25	-2.08
OTC	19.88	7.13	Seagate Technology*	15.50	0.25	1.64
NYS	78.00	25.38	Storage Technology*	66.75	-6.00	-8.25
NYS	20.88	10.00	Tektronix Inc.	17.00	-1.75	-9.33
NYS	82.25	51.50	Xerox Corp. (H)	75.38	-2.75	-3.48

Services — Off 4.77

Exch	52-Week High	52-Week Low	Company	March 6 Close	Wk Net Change	Wk Pct Change
OTC	28.50	16.25	American Mgmt. Systems*	21.50	-0.25	-1.19
NYS	5.38	2.88	Anacomp Inc.	4.88	0.00	0.00
OTC	19.00	12.00	Analysts Int'l (H)	17.50	-1.25	-6.67
NYS	48.00	25.50	Auto Data Processing*	43.25	-1.00	-2.26
NYS	20.13	16.12	Computer Inc.* (L)	18.13	-2.75	-14.57
OTC	14.50	7.75	Computer Horizons	11.00	-0.75	-6.38
NYS	84.88	62.25	Computer Sciences* (H)	73.25	-9.13	-11.08
NYS	11.25	7.00	Computer Task Group	8.38	-0.63	-6.25
OTC	19.25	7.75	Corporate Software (H)	17.25	-1.00	-5.48
OTC	28.25	10.88	Egghead Discount Software (H)	25.75	0.75	3.00
NYS	66.13	39.25	General Motors E (EDS)*	68.88	2.88	9.04
OTC	35.38	8.88	Intelligent Electronics (H)	22.75	-4.25	-15.74
OTC	14.88	6.12	Kenan (H)	13.25	-0.63	-4.50
OTC	15.00	9.75	Microage Inc.	14.00	0.38	2.75
OTC	41.25	16.50	Paychex	35.50	-2.50	-6.58
NYS	75.00	43.25	Policy Management Sys. (H)	65.75	-2.75	-4.01
NYS	41.38	16.75	Reynolds and Reynolds (H)	39.38	2.50	6.75
OTC	32.00	21.25	SEI Corp. (H)	30.50	-1.50	-4.88
OTC	24.38	15.75	Shared Medical Systems (H)	19.50	-1.63	-7.86
OTC	24.25	12.25	Sungard Data Systems (H)	21.25	-2.25	-9.67
NYS	6.13	1.13	Ultimate Corp	3.00	-0.38	-11.11

KEY: (H) = New annual high reached in period; (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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IN BRIEF

IBM's bond rating cut

■ **Moody's Investors Service, Inc.** last week tossed IBM out of its top tier, knocking the beleaguered computer vendor's gilt-edged Triple-A bond rating down two pegs to A-2 classification. IBM said the bottom-line impact of the move is likely to be minimal.

■ New York-based financial services provider **Nationar** recently proved itself a firm that can turn on a Dime. Its multimillion-dollar, six-year deal to outsource a slew of back-office functions for **The Dime Savings Bank of New York** should save The Dime about $800,000 a year, Chief Information Officer Jack Wagner said.

■ Longtime **Oracle Corp.** Applications Division Marketing Vice President M. R. Rangaswami has departed the $1 billion database vendor to oversee marketing for a small Tucson, Ariz., client/server software developer, **Interactive Information Systems, Inc.** (IIS). He joins former Oracle colleague Gary Gibson, who became IIS' chief executive officer late last year.

DEC plays third-party cards in Alpha hand

BY SALLY CUSACK
CW STAFF

Digital Equipment Corp. has high hopes that Alpha will become a major architecture in the chip manufacturing arena. Toward that end, DEC will license the Alpha architecture and work actively with semiconductor companies.

The plan is to make the technology available at all levels of products and integration, including chips, boards, subsystems and customized solutions, said William Demmer, vice president of the VAX/VMS Systems and Servers Group.

The company already licensed the technology to Cray Research, Inc. for its parallel supercomputers and recently signed up Kubota Pacific Computer, Inc. Kubota will augment its current line of Titan three-dimensional workstations with the Alpha OSF/1 architecture.

Adding fuel to the fire, Microsoft Corp. Chairman Bill Gates said recently that the Windows New Technology operating system will definitely be licensed on the Alpha boxes.

DEC would only acknowledge that it is engaged in "serious discussions" with Microsoft.

"We see the presence of partners as a key element in expanding Alpha," said Demmer, adding that customers can look forward to third-party and independent software vendor joint announcements starting as early as next month.

DEC has revealed that it is talking with a major chip manufacturer regarding the licensing of the Alpha technology. DEC is manufacturing the new chips at its facilities in Hudson, Mass., and South Queensferry, Scotland.

One analyst theorized that not too many other manufacturers would have the means to produce a 0.75-micron chip. Intel Corp. is one of a very few with such a capability, he said.

Evaluation quantities of the 21064-AA microprocessor are available now. It is priced at $3,375 each in units of 1 to 100; $1,650 in units of 101 to 1,000; and $1,559 for more than 1,000 units. Quantity shipments are scheduled to begin in July, according to the company.

Alphabet soup

DEC's initial reduced instruction set computing chip, the 21064, is a 150-MHz microprocessor said to perform at up to 300 million instructions per second. Other features include the following:

- A 0.75-micron CMOS-based superscaler and super pipelined processor.
- An on-chip write buffer with four 32-byte entries.
- An on-chip pipelined floating-point unit.

Intel takes chip maker to court over patent

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Back in court again in its most recent lawsuit, Intel Corp. is targeting San Jose, Calif.-based Chips and Technologies, Inc. over alleged patent infringement.

Two complaints, filed Feb. 28 in U.S. District Court here, allege that Chips and Technologies' Super386 and SuperMath chip products, now in production, infringe on six Intel patents, an Intel spokeswoman said.

Intel has also asked the court to dismiss claims by Chips and Technologies that Intel's 80386 SL products infringe on Chips and Technologies' patents.

A Chips and Technologies spokesman said a lawsuit is being discussed but has not been filed with the company's counterclaim.

Moreover, Intel has asked the court to permanently bar any technology transfers involving the chips in question. The court refused to hear Intel's request last month. If granted, the injunction would prohibit Chips and Technologies from having Texas Instruments, Inc. in Dallas manufacture the CPUs. TI reportedly is interested in marketing the chips under its own name. Chips and Technologies makes none of its own microprocessors.

"We are extremely surprised and disappointed," a Chips and Technologies spokesman said of the suits. He rejected Intel's charges and said both companies had been talking about the new chips and possible conflicts. Intel said it is downplaying the suit to stop tempers from becoming inflamed.

Millard Phelps, an analyst at Hambrecht & Quist, Inc. in San Francisco, said the litigation continues to form a pattern. "Intel has been very, very aggressive about anything that infringes on its business [interests]," he said.

Intel is already involved in a fierce lawsuit with archrival Advanced Micro Devices, Inc. (AMD) over its 386 chip design. An arbiter recently said AMD should be granted rights to the 386 and awarded the company $15 million in damages [CW, March 2]. Intel said it would appeal the ruling in California Superior Court, where the case is being tried.

$15,576,923,120

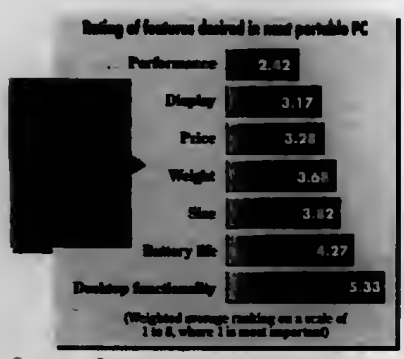
By the end of this week
Computerworld readers will have spent
over $15.5 Billion on
Information Technology this year — representing nearly
all IT spending to date in 1992.

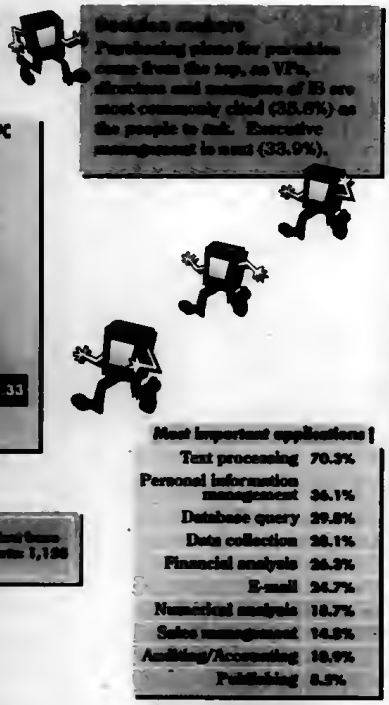
COMPUTERWORLD

TRENDS

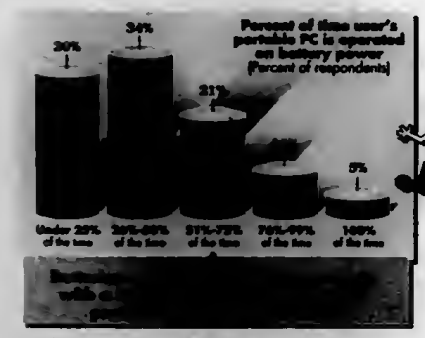
Portable PCs

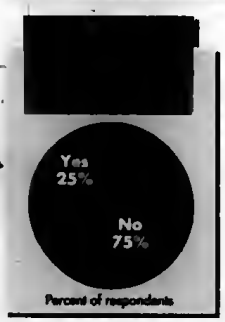
How do users feel about their portable PCs? Most take them pretty seriously and are looking for better performance and displays in their next purchase.





Most important applications	
Text processing	70.3%
Personal information management	36.1%
Database query	29.8%
Data collection	28.1%
Financial analysis	26.3%
E-mail	24.7%
Numerical analysis	18.7%
Sales management	14.8%
Auditing/Accounting	10.9%
Publishing	8.5%



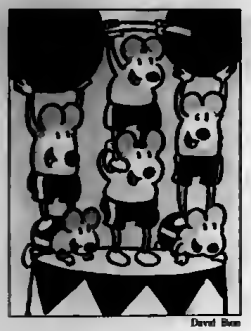


Source: Venture Development Corp., Natick, Mass.

CW Chart: Michael Siggins

NEXT WEEK

The key to getting a platoon of linked workstations to work on a single problem is a computer programming language called Linda, which was developed 13 years ago. Now, some fast-moving companies are preparing to market software and other products derived from Linda. Read all about it in next week's Advanced Technology.



David Bean

Embedded computer systems. CPU clusters. Terabyte-size memories. Language translation. These are but a few innovations you can expect for the computer industry in the near and long term. Veteran industry watcher and *Computerworld* columnist Charles P. Lecht gives you a glimpse into the future in next week's In Depth.

INSIDE LINES

'Beware the Ides of March'

▶ IS employees at Blue Cross/Blue Shield of Massachusetts are counting the days until mid-March, hoping a recently signed outsourcing deal with Electronic Data Systems doesn't cost any jobs. EDS last week declined to comment on whether, as rumored, March 20-23 is in fact targeted for Blue Cross layoffs. "We're still in the assessment period — and not in a position to give out numbers or dates. We just don't know yet," an EDS spokesman said. Earlier, the company hinted at minimal layoffs.

Snappy links

▶ Hewlett-Packard, no laggard in the SNA connectivity arena, is expected this week to announce plans to bundle all of its disparate IBM links into a single client/server package called SNAplus. The result is that the full range of HP systems will be able to access the same server for the full range of SNA connections, including peer-to-peer links, according to an HP statement. The 1993 portion of the rollout will bring in HP Vectra PCs and Apollo Domains, as well as SNA over X.25 and IBM NetView connections.

Macintegrator

▶ Apple Macintosh users engaged in the tricky job of building a client/server system will get a break this spring when Apple finally releases a key internal document that offers implementation blueprints for a variety of hardware and software configurations. The 1,000-page document, called Vital, summates the collective experience of Apple integrators. It has been used for years within the company.

Buffalo chips

▶ Those watching Chips and Technologies' progress with its Super386 chip were not all that surprised by Intel's suit seeking an end to development, manufacturing and sales of the CPU (see story page 121). They say Chips and Technologies is really on to something with the chip, which is compatible with all software based on all Intel CPUs. The other shoe dropped, however, when Chips and Technologies reportedly began discussing distribution arrangements with Texas Instruments. TI, though down, is not out. It can put the Super386 on the map through sheer marketing muscle.

PC crazy

▶ Rumors once again surfaced that DEC may be looking to acquire a clone maker to spearhead its thrust into the direct mail-order PC marketplace. Rumors persist that Compaq, and even Dell, are at the top of DEC's acquisition list.

Come, let us reason together

▶ Seven selected members of the International Oracle Users Group (IOUG) sat down with top Oracle executives in California late last week to reestablish the company's Affinity customer feedback program. The program fell into disuse for 14 months when Oracle was resolving financial and quality control problems. IOUG is seeking to satisfy a number of key concerns, such as when Version 7.0 will become generally available and how prevalent user pricing will become.

Vocabulary lessons

▶ In the midst of a new product briefing for about 200 customers at KnowledgeWare's user conference in Atlanta last week, KnowledgeWare product strategist Pete Privateer talked about how the company's client/server plans reflected an industry trend to "downsize." He quickly rephrased the statement, saying instead that users are "rightsizing. IBM would prefer us not to use the term downsizing," he explained.

A speaker at KnowledgeWare's user conference last week said that trudging through the computer industry these days takes special determination. He quoted Jonathan Swift, who said: "Vision is the ability to see things invisible," after which someone from the audience yelled out, "Yeah, like AD/Cycle." We at Computerworld *are always looking to shed light on the invisible. Any tips? Phone, fax or Compuserve News Editor Alan Alper at (800) 343-6474; (508) 875-8931 or 76537,2413.*

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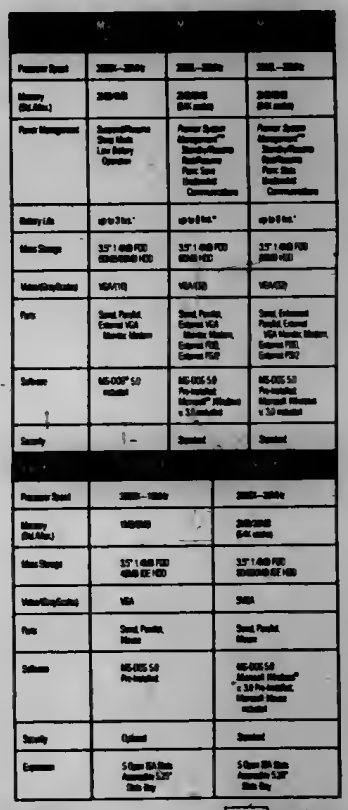

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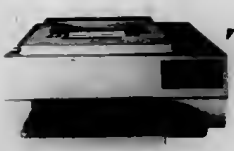

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